# ICP DAS WISE
# User Manual
# for WISE-580x Series

[Version 1.58]

ICP DAS CO., LTD.

泓格科技股份有限公司

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# 1 Introduction

WISE-580x(Web Inside, Smart Engine) PAC Controller is an Intelligent Data Logger PAC designed by ICP DAS that functions as control units for use in remote logic control and monitoring in various industrial applications. WISE-580x offers a user-friendly and intuitive HMI interface that allows you to implement control logic on controllers just a few clicks away; no programming is required. With this powerful and easy-to-use software, it will minimize the learning curve, shorten time to market and dramatically reduce the labor and cost spent on system development.

Through Web browser, you can access Web Server on WISE-580x to perform tasks such as logic rule edition and download. WISE-580x equips an IF-THEN-ELSE rule engine that will check whether the rules are valid or not and determine the execution of actions under specific conditions, for examples: setting up I/O channel values, perform scheduled and Timer tasks, sending Email under a specific condition. In addition, through the Modbus TCP/RTU Protocol, it enables SCADA software to control and monitor I/O channel or system status on controllers in real time.

In addition to merits inherited from the previous WISE series, WISE-580x even provides more supports in I/O functions. It allows to connecting with a wide range of the XW-Board, I-7000 Remote I/O modules and Modbus RTU/TCP Slave modules; enables to freely choose the most suitable I/O modules. With the microSD card, it provides Data Logger function to real-time record the I/O data of the controller and allows to send the data files by FTP or Email at a scheduled time to the control center for further administration management or data analysis.

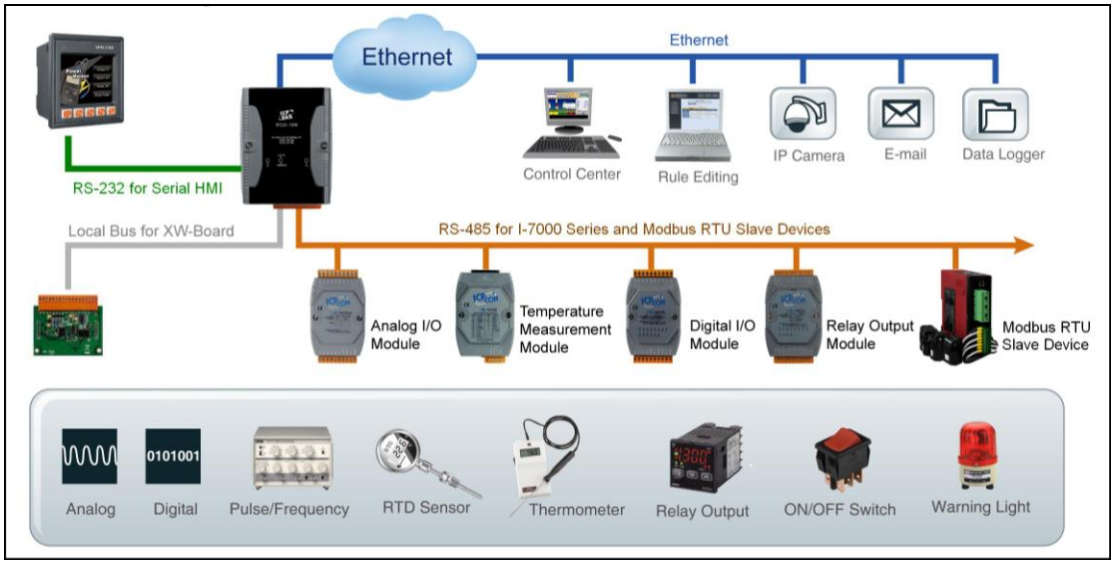



**Figure 1-1：WISE-580x System Architecture**

WISE- 580x system features:

- **IF-THEN-ELSE logic rules execution ability**

  WISE-580x equips with an IF-THEN-ELSE logic Rule Engine, it offers up to 36 IF-THEN-ELSE rules for you to set up the logic content. After completing rule edition and downloading rules to the WISE controller, the Rule Engine will loop execute the rules in order under specific conditions.

- **No programming is required to implement logic content on controllers**

  WISE-580x provides user-friendly Web UI pages for editing control logic on the controllers. It enables to implement logic edition by a few clicks on the mouse to set up and deploy logic rules without writing a single line of code.

- **No extra software tool is required; all operations can be done through the Web browsers**

  Provides Web-based HMI interface runs on regular Web browsers. To edit control logic, it only requires a browser to connect to the Web server on WISE-580x. No extra software tool installation is needed on the target PC.

- **Support XW-Board and I-7000 I/O Module**

  WISE-580x allows to connecting with a wide range of the XW-Board and I-7000 Remote I/O modules that enables to find best solutions to meet the requirements. Please refer to the following table for I/O modules and functions:

| | Functions | | Modules |
|---|---|---|---|
| I-7000 Remote I/O Module | AI/AO | Voltage & Current | I-7012, I-7017 |
| | | Thermocouple | I-7011, I-7018, I-7019 |
| | | RTD | I-7013, I-7015, I-7033 |
| | | Thermistor | I-7005 |
| | | Transmitter | I-7014 |
| | | Analog Output | I-7021, I-7022, I-7024 |
| | DI/DO | DC Digital Input | I-7041, I-7051, I-7052, I-7053 |
| | | AC Digital Input | I-7058, I-7059 |
| | | DC Digital Output | I-7042, I-7043, I-7045 |
| | | DC Digital Input & Output | I-7044, I-7050, I-7055 |
| | Relay Output | Power Relay Output | I-7060, I-7061, I-7063, I-7065, I-7067 |
| | | Solid State Relay Output | I-7063A/B, I-7065A/B |
| | | Photomos Relay Output | I-7066 |
| | Others | Counter/Frequency | I-7080, I-7088 |
| DL Series | Temperature and Humidity | | DL-100T485、DL-302 |

| | | |
|---|---|---|
| XW-Board | DI/DO | XW107、XW107i、XW110i |
| | DI/DO/AI/AO | XW304、XW310、XW310C |

**Figure 1-2：WISE-580x IO module support list**

- **Support Modbus RTU/TCP Slave Module**

  In addition to XW-Board and I-7000 I/O modules, WISE-580x also allows to connect with devices that support Modbus RTU/TCP Slave protocol for I/O monitoring. The ability to connect with Modbus RTU/TCP Slave devices enables flexibility and scalability for system implementation and allows to meet various requirements from the clients.

- **Provide Timer and Schedule operation**

  WISE-580x features two kinds of timing functions: Timer and Schedule. It allows you to perform specific tasks such as time delay, or schedule specific date or time for control logic execution. To ensure the accuracy of the WISE controller clock, it also has the ability to sync the clock to an SNTP time server for time synchronization through the network.

- **Provide Email message and CGI command sending functions**

  WISE-580x supports Email message and CGI command sending functions. Email and CGI command functions are important function for real-time message communication. The sending action can be added to the logic edition as part of logic control to provide real-time message transmission or sending CGI command for device control in response to specific events.

- **Recipe function for Group Action operation**

  WISE-580x provides Recipe function that allows to execute a sequence of actions previously saved in the Recipe to response to IF-THEN-ELSE logic rules Conditions. You can create different Recipe sets to meet various requirements for different applications.

- **Data Logger function**

  With the microSD card, WISE-580x provides Data Logger function to real-time record the I/O data of the controller and sends the data files by FTP or Email to the control center for further administration management or data analysis.

- **Real-time monitoring system status of controllers**

  WISE-580x supports Modbus TCP/RTU Protocol for you to perform real-time

monitoring and control of the controllers. Please refer to Appendix 1 for the mapping table of controller system information and Modbus Address. In addition, WISE provides an easy-to-view HMI web interface for real-time monitoring. It allows you to get important real time system information even without SCADA software.

- **Password protection for access control**

  WISE HMI web page offers password protection. After getting in the webpage, you will be required to input the password before editing logic rules. In addition, WISE-580x provides monitoring web pages specifically designed for cell phone. The access control restricts the access to the webpage to prevent unauthorized modification; it allows to set up passwords for guest and administrator; only the authorized users will be allowed to modify the channel data.

- **Provides SMS command receiving function and alarm notification function (Only apply to WISE-5801)**

  WISE-5801 equips SMS command receiving and alarm message notification function. It allows to include SMS alarm sending action into logic rules to send a pre-set SMS message to related personnel when an event occurs. In addition, WISE-5801 allows to receive the SMS commands sending by specific phones numbers to perform tasks such as real-time channel monitoring, channel data modification and logic rules execution (triggered by SMS), etc.

- **Active I/O Sending function**

  In addition to the Modbus TCP/RTU Slave function that enables SCADA software (or HMI device) to poll the I/O channels value of the WISE controller, now WISE-580x provide the new function “Active I/O Sending” for user. Based on the “Active I/O Sending” function, WISE-580x can send the I/O channels value of the controller actively to SCADA software (or HMI device) by event trigger (I/O channel value changed) or periodic cycle. This function will improve the efficient of the data communication between WISE-580x and SCADA software (or HMI device). Please note: The SCADA software (or HMI device) must equip the Modbus TCP Slave function to receive the I/O channels data sent by WISE-580x.

**This document is intended to give you a full-range instruction to WISE-580x controllers. You will be able to learn how to edit logic of the rules and how to download the rules to the controllers for conditional execution.**

# 2 Before Connection

Before connecting to WISE-580x Web HMI pages, please complete the following steps to implement network configuration and I-7000 modules parameter settings. The procedures are as follow:

## 2.1 Network configuration

- Please make sure the Init Switch on the controller has been switched to "OFF" position. Connect the controller to power supply and to the network. The Init Switch position is shown as below:

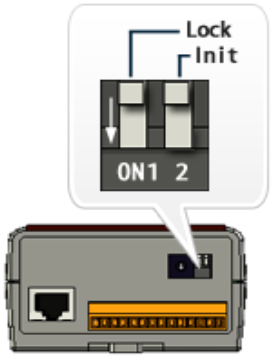



**Figure 2-1：The Init Switch on the controller**

- Install and execute MiniOS7 Utility. MiniOS7 Utility can be downloaded from the following link. **Please download version v3.2.4 or later.**
  http://ftp.icpdas.com/pub/cd/8000cd/napdos/minios7/utility/minios7_utility/

- On toolbar, select Connection→Search (shown as below). A "MiniOS7 Scan" window will pop up and automatically start to search controllers in the network.

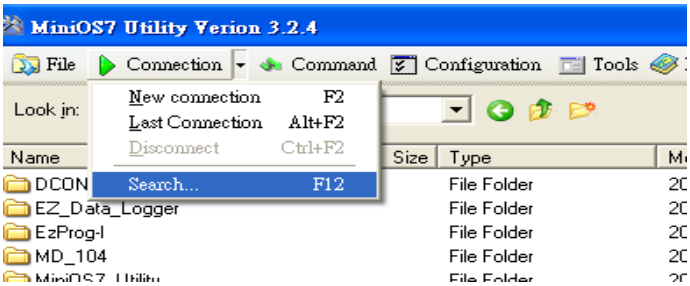



**Figure 2-2：Select "Search" function on MiniOS7 Utility**

- After finish searching, find the target controller and click “TCP Broadcast”, and then click “IP Setting” button on the toolbar as shown below:

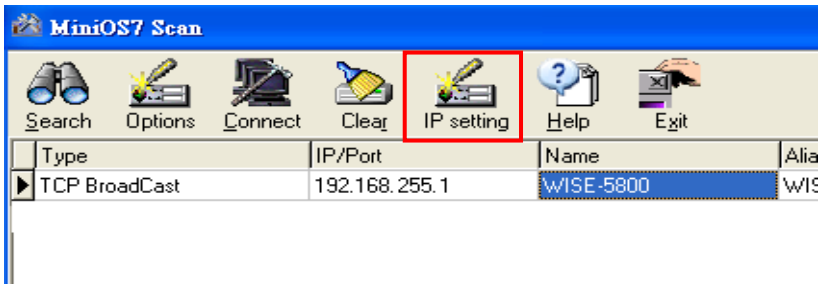



**Figure 2-3：IP Setting button on MiniOS7 Scan**

- Click “IP Setting” button, a network settings window will pop up. Input the information and click the "Set" button to complete the settings.

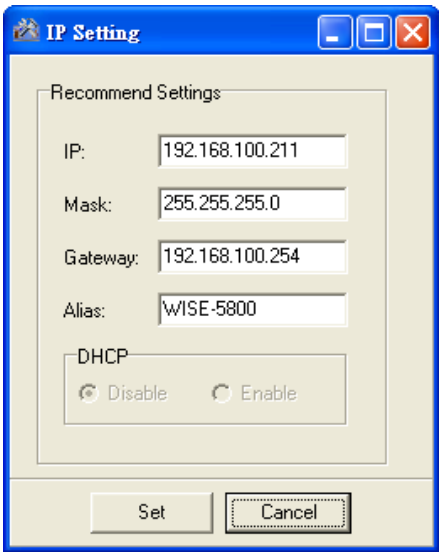



**Figure 2-4：Network Settings page**

- After finish Network settings, reboot the WISE-580x controller for the changes to take effect.

## 2.2 I-7000 Module Parameter Settings

To access I/O data on I-7000 Modules, it is required to complete I-7000 module parameter settings before trying to communicate with I-7000 Modules. The I-7000 module parameter settings can be done by DCON Utility.

◆ You can download DCON Utility from the link below:
http://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_utility/
And you can download DCON Utility manual from the link below:
http://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_utility/manual/

◆ Install the DCON Utility on PC and connect the I-7000 Module to the PC for parameter settings, please follow the steps below (for more detailed information, please refer to DCON Utility manual):

i. Connect the I-7000 modules to the PC (with DCON Utility installed) via RS-485 line, make sure the RS-485 line is properly connected. For PC to receive RS-485 signals, a RS-232 to RS-485 or a USB to RS-485 converter is required. For more converter information, please refer to ICP DAS converter product page:
http://www.icpdas.com.tw/product/solutions/industrial_communication/converter/converter_selection.html

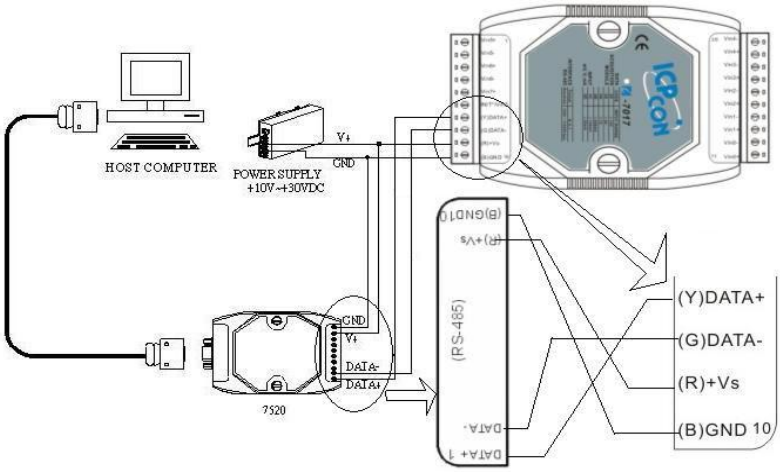



**Figure 2-5：I-7000 module connection via RS-485 line**

ii. Start the DCON Utility and verify if the COM Port value is accurate.

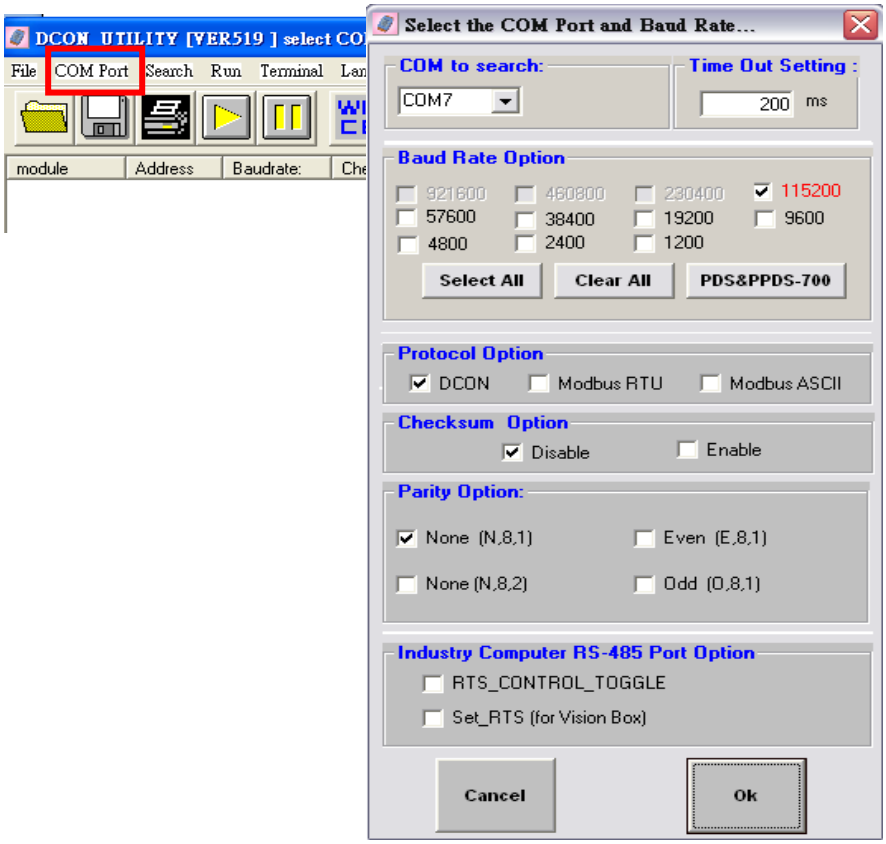



**Figure 2-6：Check COM port, Baudrate, and DCON Protocol settings**

iii. Perform "Search" to find all I-7000 modules that are connected to the PC.

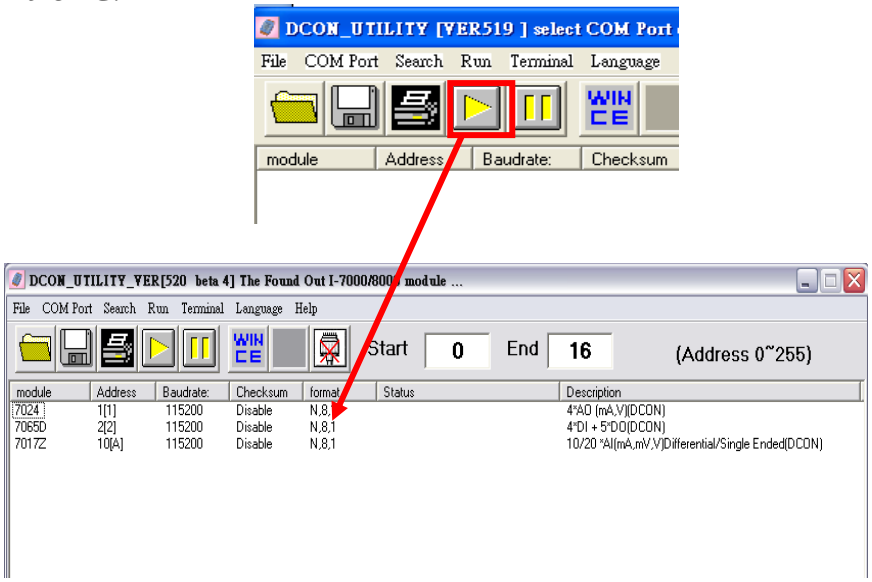



**Figure 2-7：I-7000 module Search**

iv. Click on the I-7000 module to bring up the “Configuration Window” and setup the parameters (such as Address, Baudrate, Checksum) for the module. The “Configuration Window” will be shown as follow(I-7017Z as an example):

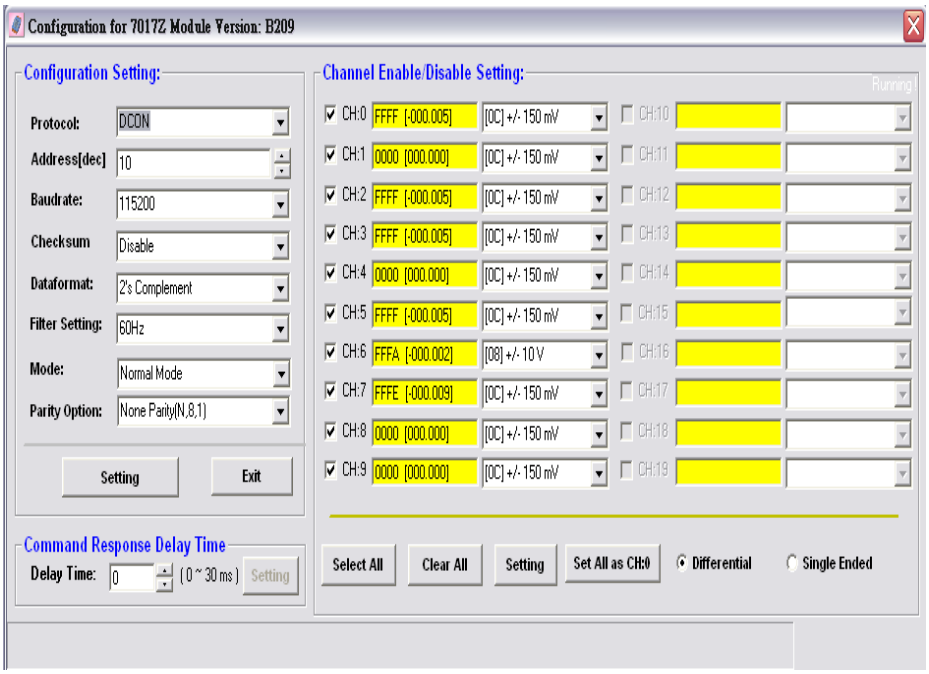



**Figure 2-8：I-7000 module configuration window**

Please note: The following parameters has to be accurate to connect with WISE-580x properly:

- Communication Protocol: has to be set as DCON。
- Address: the address has to be set between 1~16, please note: the configuration of I-7000 module address on WISE-580x has to be set exactly the same.
- Baudrate: the Baudrate has to be set the same as the Baudrate of WISE-580x COM2, all I-7000 modules’ Baudrate have to be set the same as well.
- Checksum: set to be “Disable”(The default setting on WISE is “Disable”.). You can change to “Enable”, but the setting on WISE also has to be changed to“Enable” to ensure this function.
- Data format: set to be “2’s Complement” (Except for I-7024, it only uses “Engineering Unit” format).
- Parity Option: set to be ”None Parity(N,8,1)”。

Complete the other settings as required.

# 3 WISE Web Page Overview

WISE-580x provides two web page interfaces: Logic Setting page and Channel Monitoring page. The Logic Setting page allows to perform logic setting on WISE controller. And the Channel Monitoring page allows to monitor or modify the I/O channel data on WISE Controller. WISE-580x equips v2.44(or later) firmware would upload the rule setting automatically when the web page is connected.

## 3.1 Logic Setting Page

When you connect to WISE-580x by Web browser (IE, Firefox or Chrome browser), WISE will automatically connect to the Logic Setting page. In order to get a better operation experience, 1280x1024 resolution is recommended. The Logic Setting page of WISE-580x controller is shown as below:

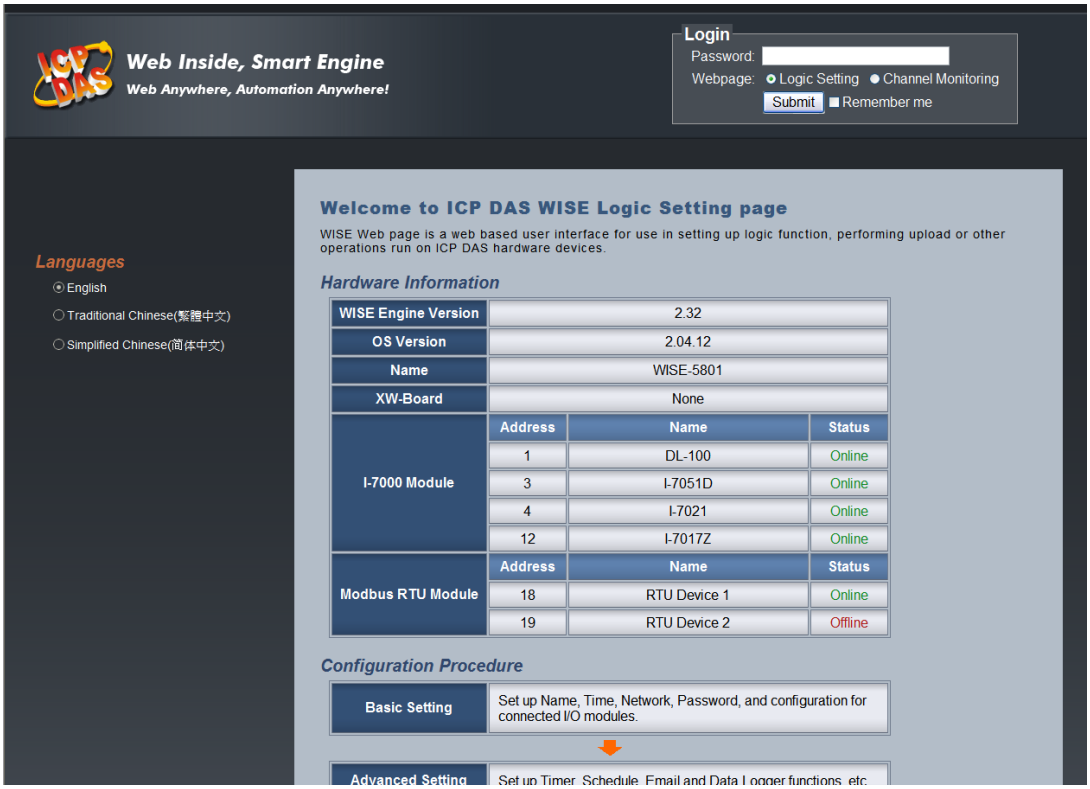

Web Inside, Smart Engine
Web Anywhere, Automation Anywhere!
Login
Password:
Webpage: Logic Setting Channel Monitoring
Submit Remember me
Languages
English
Traditional Chinese(繁體中文)
Simplified Chinese(简体中文)
Welcome to ICP DAS WISE Logic Setting page
WISE Web page is a web based user interface for use in setting up logic function, performing upload or other operations run on ICP DAS hardware devices.
Hardware Information
WISE Engine Version 2.32
OS Version 2.04.12
Name WISE-5801
XW-Board None
I-7000 Module
Address Name Status
1 DL-100 Online
3 I-7051D Online
4 I-7021 Online
12 I-7017Z Online
Modbus RTU Module
Address Name Status
18 RTU Device 1 Online
19 RTU Device 2 Offline
Configuration Procedure
Basic Setting
Set up Name, Time, Network, Password, and configuration for connected I/O modules.
Advanced Setting
Set up Timer, Schedule, Email and Data Logger functions, etc.

**Figure 3-1：Main page of the Logic Setting page**

You will be required to enter the password to login into the page before performing logic settings. The login section is on right upper corner, as shown below:

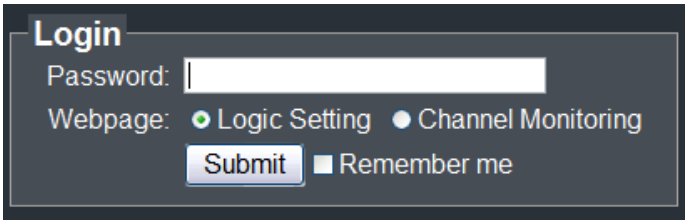



**Figure 3-2：Login page of the Logic Setting page**

Both default passwords set for Administrator and Guest are "**wise**". You can follow the instruction in "4.4 Password Setting" section to modify the password. Please note that the Logic Setting page only allows **Administrator** to log in. If you only need to view the channel data, please select the Channel Monitoring option under the "Web Page" selection. It will automatically be directed to the Channel Monitoring page.

The Logic Setting page after login is shown as bellow:

Web Inside, Smart Engine
Web Anywhere, Automation Anywhere!
1.Basic Setting
2.Advanced Setting
3.Rules Setting
Channel Status
Upload from Module
Download to Module
Languages
English
Traditional Chinese(繁體中文)
Simplified Chinese(簡体中文)
Welcome to ICP DAS WISE Logic Setting page
WISE Web page is a web based user interface for use in setting up logic function, performing upload or other operations run on ICP DAS hardware devices.
Hardware Information
WISE Engine Version 2.32
OS Version 2.04.12
Name WISE-5801
XW-Board None
I-7000 Module
Address Name Status
1 DL-100 Online
3 I-7051D Online
4 I-7021 Online
12 I-7017Z Online
Modbus RTU Module
Address Name Status
18 RTU Device 1 Online
19 RTU Device 2 Offline
Configuration Procedure
Basic Setting
Set up Name, Time, Network, Password, and configuration for connected I/O modules.
Advanced Setting
Set up Timer, Schedule, Email and Data Logger functions, etc.

**Figure 3-3：After login the Logic Setting page**

Six buttons will appear on the upper part of the Web page:

- Basic Setting
- Advanced Setting
- Rules Setting
- Channel Status
- Upload from Module
- Download to Module

The main page will show the version of WISE-580x firmware (WISE Engine Version), the OS version of the controller and the controller module name. A list of I/O devices that currently are connected to the WISE-580x; such as the XW-Board, I-7000 modules and Modbus RTU/TCP modules; will be displayed as well. And the connection status will also be shown on this page. In addition, the general WISE-580x Logic Setting Web UI operating procedures will be displayed as follow:

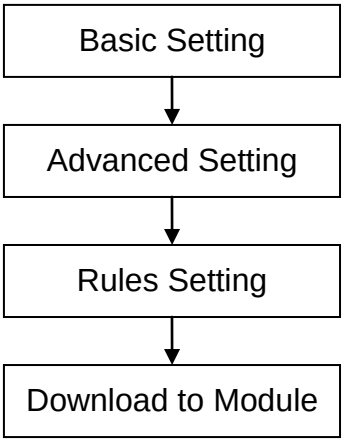



**Figure 3-4：WISE-580x Logic Setting Operation Procedures**

Please note: DO NOT refresh or close the web page when you are editing the rules, otherwise the contents of all previous settings will be gone. And please remember all settings will take effect only when they have been downloaded to modules, if you close the web page before finishing “Download to Module”, all settings will be disappeared as well.

In addition, there is a language selection menu on the left region of the main page. WISE Web UI offers 3 languages: English, Traditional Chinese and Simplified Chinese for you to choose your preferred languages. The system will memorize previous language selection, and will automatically switch to the previously chosen language next time when connected to the WISE Web

UI.

Please note: do not change the language setting during the process of rule edition; otherwise the previous edited content might disappear. It is recommended to perform language selection at the beginning when connected to the Logic Setting page or after finishing “Download to Module”.

## 3.2 Channel Monitoring Page

When you connect to WISE-580x controller by cell phone, it will automatically being directed to the Channel Monitoring page, the Channel Monitoring page is shown as below:

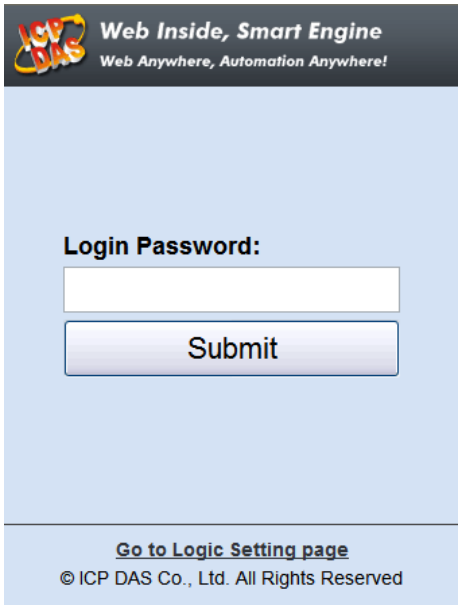

Web Inside, Smart Engine
Web Anywhere, Automation Anywhere!
Login Password:
Submit
Go to Logic Setting page
© ICP DAS Co., Ltd. All Rights Reserved

**Figure 3-5：The Channel Monitoring page (before login)**

You can input the password to get into the Channel Monitoring page or select the “Go to Logic Setting page” to perform logic settings. After you login into the page, it will show WISE-580x module name, and will list all I/O devices currently connected to the WISE-580x; such as the XW-Board, I-7000 modules and Modbus RTU/TCP modules. The interface is shown as below:

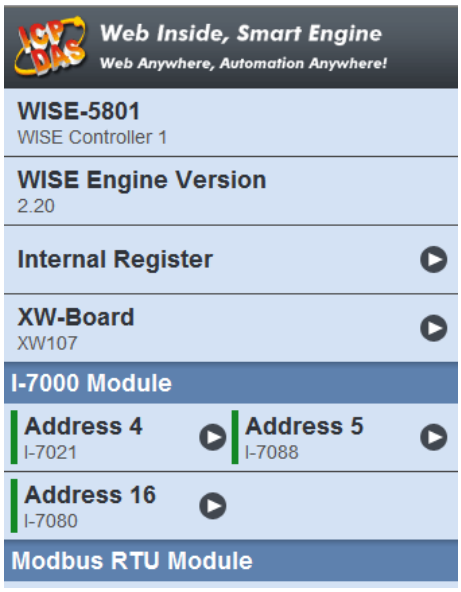



**Figure 3-6：The Channel Monitoring page (after login)**

If you login into the Channel Monitoring page as a Guest, you can only view the channel data. You will not be allowed to modify the data. You are required to login as Administrator to modify the channel output data such as DO, AO, Internal Register, Coil Output and Holding Register value. The following figure shows the interface that will be displayed when login as an Administrator. You can directly enter specific values to output channel data.

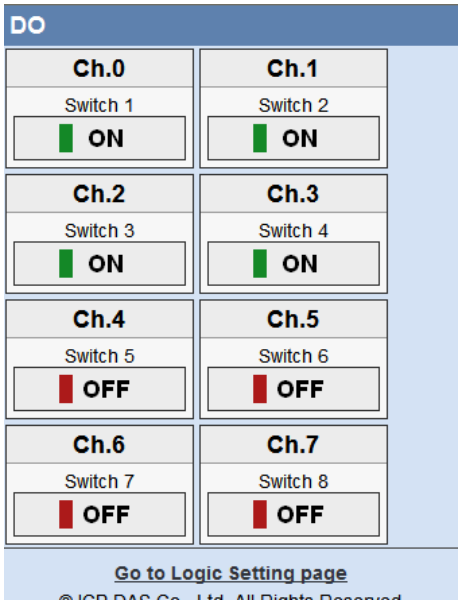



**Figure 3-7：Login into the Channel Monitoring page as Administrator**

The following figure shows the interface when login as a Guest. The Guest can only view the channel data without the permission to modify the data.

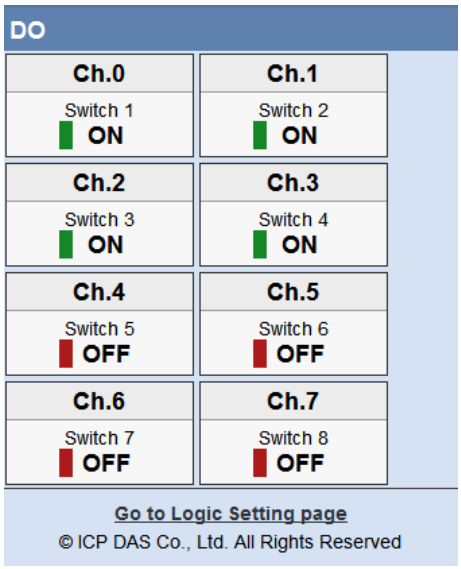



**Figure 3-8：Login into the Channel Monitoring page as Guest**

# 4 Basic Setting

Under the Basic Setting section, you can set up Name Setting, Time Setting, Ethernet Setting, Password Setting, XW-Board Setting, I-7000 Module Setting and Modbus RTU/TCP Module Setting.

## 4.1 Name Setting

Name Setting page is for you to give your controller a name for easy recognition and identification. Name Setting page is shown as follow:

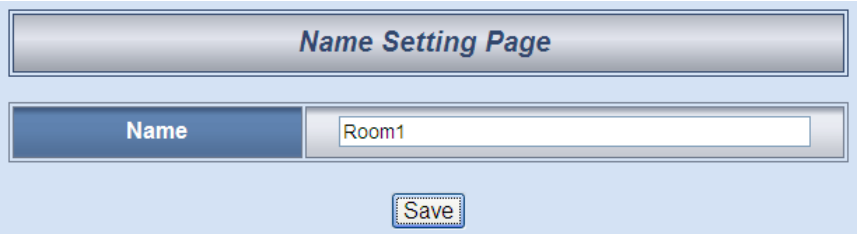



**Figure 4-1：Name Setting page**

If you have already given a name to this controller, when you get on this page, the name you previously set up will be shown on the page. After you modify or input the name, click Save to save the change. The name you input will appear on the top of the page as shown below. Please note: the Save button on Name Setting page is for temporary storage only, to complete the Name Setting and save the change to the controller, please finish the process of "Download to Module".

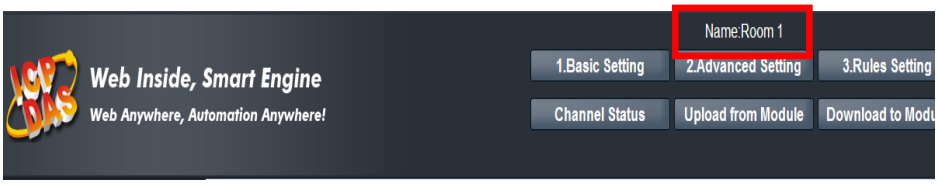



**Figure 4-2：The Name location on WISE Web Page**

## 4.2 Time Setting

Time Setting is for setting up time on WISE controller. It also allows to set up Time Synchronization to sync the clock through network (with SNTP Time Server). The following figure illustrates the set up interface:

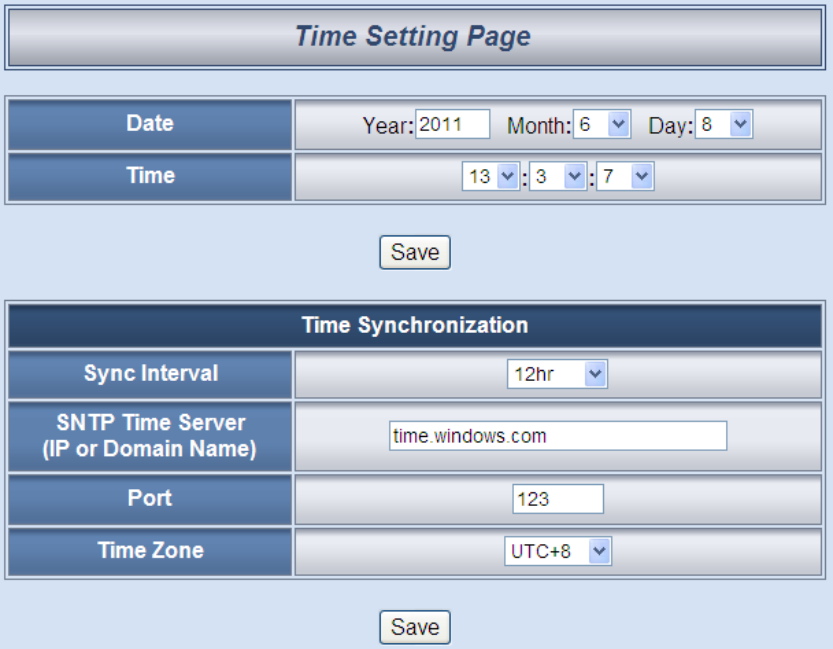



**Figure 4-3：Time setting page**

On every entry you make, this page will display current date and time that are read from the hardware device clock. You can remotely modify the date/time of the hardware device clock here. After you finish modification, click "Save" to save all changes to the hardware devices.

WISE-580x also has the ability to sync the clock to an SNTP time server for time synchronization through the network. The Time Synchronization Setting is shown as follow:

i. In the "Sync Interval" field, select the time interval to specify how often will the WISE-580x automatically connect to SNTP time server for time synchronization through the network. If you select "disable", it means the time synchronization function will not be performed.

ii. In the "SNTP Time Server" field, input the IP address or domain name of the SNTP Time Server. Please refer to the link: "time.windows.com"- this is a standard SNTP server from Microsoft for Windows operating system to synchronize the system time.

iii. In the "Port" field, input the port number which the SNTP time server open for connection, the default port number will be "123".

iv. In the "Time Zone" field, select the time zone from the dropdown list.

After all settings are completed, click "Save" button to save the changes.

And please remember all settings will take effect only when they have been downloaded to modules, if you close the Web page before finishing "Download to Module", all settings will be disappeared as well.

## 4.3 Communication Setting

Communication Setting allows you to make a change to network configuration, web server port or Modbus settings on the controller. The following figure illustrates the configuration interface:

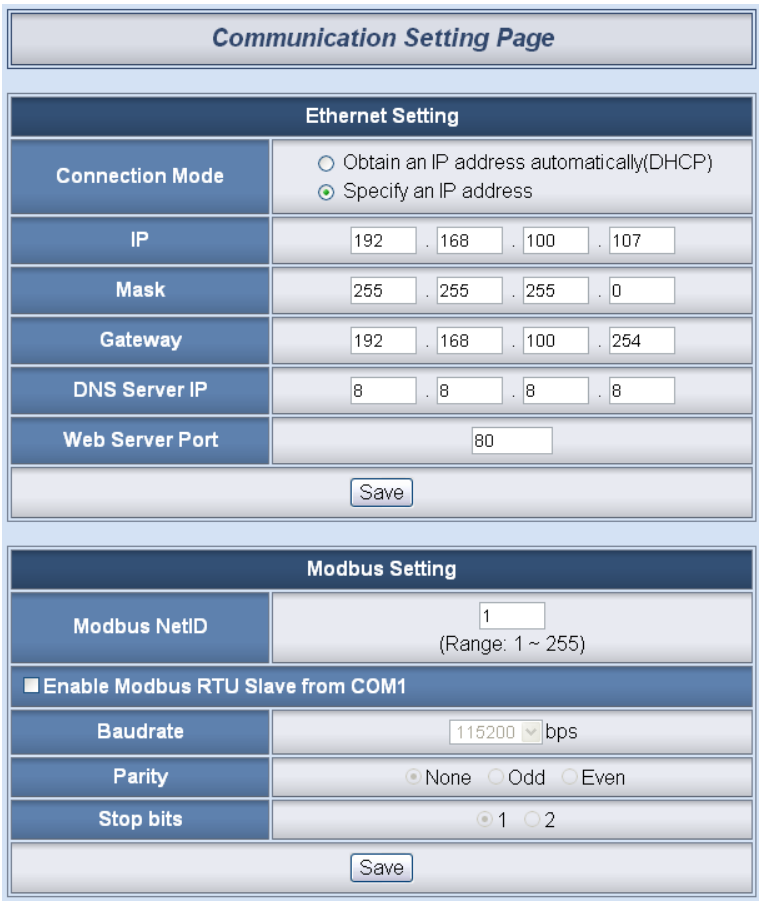



**Figure 4-4：Communication setting page**

Each time when you enter this page, it will display current network configuration and Modbus settings that are automatically read from the hardware devices. For Ethernet settings, you can select "Connection Mode" as "Obtain an IP address automatically(DHCP)" to let the controller to get the IP from DHCP server, or select "Specify an IP address" to modify the IP/Mask/Gateway configuration of the controller manually. After the IP configuration setting, please also check or modify the configuration of the Web Server Port/DNS Server in this section. After you finish modification,

click “Save” and then all changes will be saved and written back to the hardware. For Modbus settings, you can also modify the Modbus NetID in the same way. WISE supports Modbus RTU Slave function and it enables to communicate with Modbus RTU Master devices for data transmission via WISE-580x COM1(RS-232). To enable Modbus RTU Slave function for communicating with devices that equip Modbus RTU Master function; click “Enable Modbus RTU Slave from COM1” and set up COM1 settings. After finishing the settings, click “Save” to save the change.

Please note:

i. WISE adopts Google DNS server as system default DNS server, the default IP is ”8.8.8.8”, the IP can be modified to other DNS server IP.

ii. If you make any modification to the network configuration, the hardware device will reboot and re-connect to the web page automatically about 5 seconds later. But if you change the “Connection Mode” to “Obtain an IP address automatically(DHCP)”, the auto re-connection will be failed because the browser would not know the new IP address of the WISE controller. Please use MiniOS7 Utility to search the new IP address, and then re-open a browser to connect to the web page with the new IP address.

## 4.4 Password Setting

Password Setting allows you to change the password that is required when access the controller. The Password Setting page is as follow:

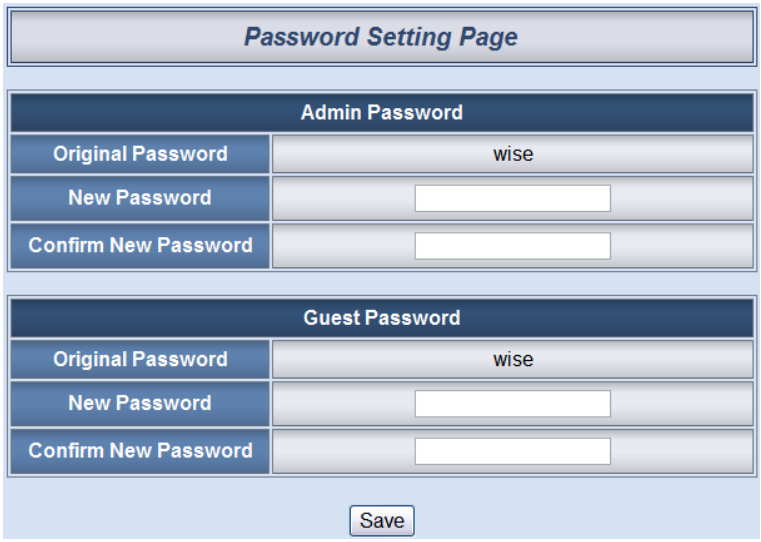



**Figure 4-5：Password setting page**

WISE provide two passwords set, one for Administrator, the other for Guest. To avoid unauthorized access and altering of data; it is required to input password before you get on the WISE webpage. Both default passwords set for Administrator and Guest are "**wise**". You can modify the password on this page. Password length is limited to 16 characters.

## 4.5 XW-Board Setting

XW-Board Setting page allows you to set up the configuration of the XW-Board that connects to the WISE-580x and function as I/O control interface. The XW-Board Setting is shown as follow:

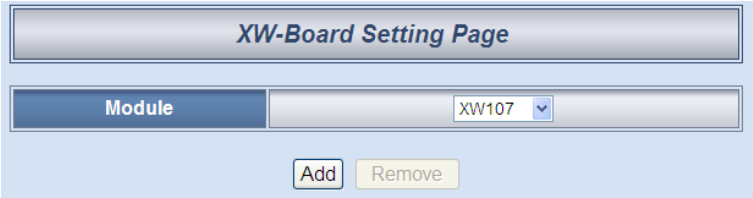



**Figure 4-6：XW-Board setting page**

Select the XW-Board you are using from the drop down list and click "Add", a window for setting up XW-Board channel parameters will appear. Complete the settings for each XW-Board channel.

Please note:

i. After you complete all configuration for XW-Board DI, DO, AI and AO channels, remember to click "Save" to save the settings.
ii. WISE-580x allows to connect with one XW-Board only, however; it allows to connect I-7000 modules and Modbus RTU modules via RS-485 interface through COM2 at the same time when connecting to the XW-Board.

### 4.5.1 XW-Board DI Channel Settings

The XW-Board DI Channel Setting page is shown as follow (using XW107 as an example):

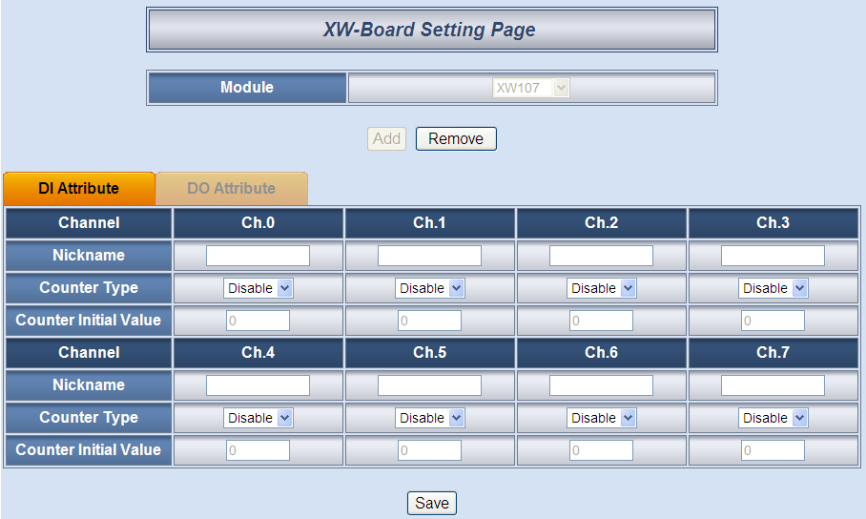



**Figure 4-7：XW-Board DI attribute setting page**

The settings are as follow:

- Nickname：For you to define nicknames for each I/O channel, this nickname will be displayed on the “Channel Status” page.
- Counter Type：Specify the counter type to be “Falling edge detection” (ON-to-OFF) or “Rising edge detection” (OFF-to-ON); if you select “Disable” indicates that the counter of this DI channel will not function.
- Counter Initial Value：You can set the initial value of the counter in the “Counter Initial Value” field. This counter will start counting from the initial count value. The default initial value is 0.

After all DI channel settings are completed, click “Save” button to save the changes.

### 4.5.2 XW-Board DO Channel Settings

The XW-Board DO Channel Setting page is shown as follow (using XW107 as an example):

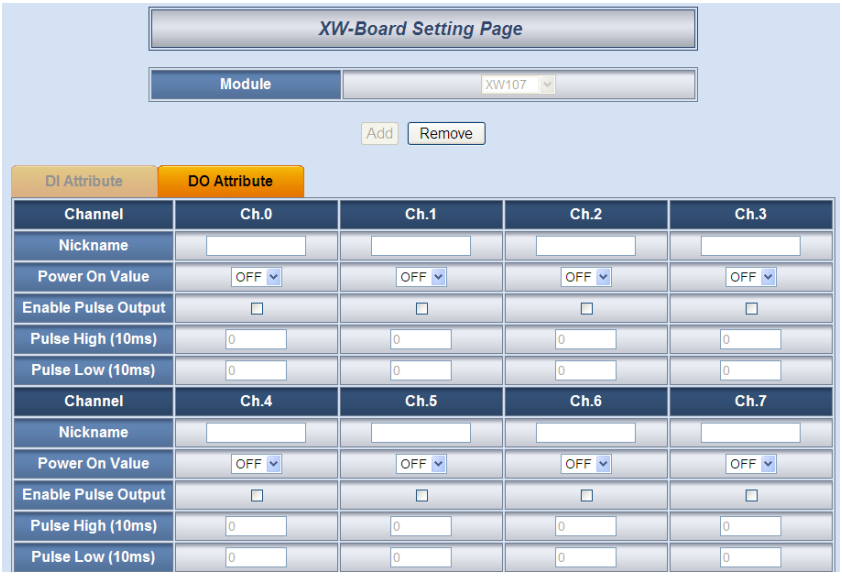



**Figure 4-8：XW-Board DO attribute setting page**

The settings are as follow:

- Nickname: for you to define nicknames for each I/O channel, this nickname will be displayed on the “Channel Status” page.
- You can specify the initial status to be “ON” or to be “OFF” when the WISE-580x is power on. Select the value from the dropdown list of “Power On Value” field. The default value is “OFF”.
- If you check the Enable pulse output checkbox, it will allow this DO channel to perform pulse output and form a periodic pulse cycle. In Pulse Output mode, the selected DO channel will generate a square wave according to specified parameters (Pulse High and Pulse Low). Pulse High and Pulse Low are required and has to be entered in multiples of 10ms. Pulse High indicates the “ON” time duration and Pulse Low indicates the “OFF” time duration in a periodic Pulse cycle.

After all DO channel settings are completed, click “Save” button to save the changes.

Please note: the DO channel of XW-Board does not offer Counter function.

### 4.5.3 XW-Board AI Channel Settings

The XW-Board AI Channel Setting page is shown as follow (using XW304 as an example):

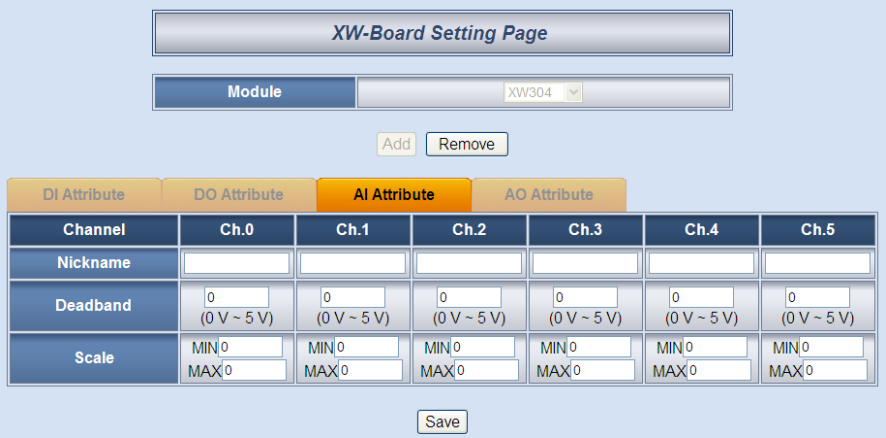



**Figure 4-9：XW-Board AI attribute setting page**

The settings are as follow:

- Nickname: For you to define nicknames for each I/O channel, this nickname will be displayed on the “Channel Status” page.
- In the “Scale” field, AI channel raw data can be set to operate with linear proportion between “MIN” and “MAX” values. The IF Condition will use the adjusted value in the logic Rule operation, and the AI value retrieved from Modbus TCP and “Channel Status” page would be the adjusted value. The default value for MAX and MIN is 0, it means the Scale function is disabled.
- Deadband: In order to avoid signal oscillation that may result in instability to the status changes, you can set up a Deadband value for the AI channel to reduce the oscillation effect to the channel value. The AI attribute configuration page is shown as below:

There are three operation styles for AI Deadband. Detailed description is as below. The AI Channel setting in following examples is 0mA ~ 20mA.

(a) In the IF Condition, when AI > or >= a numerical value:

Assuming the Deadband value is set to be 2 mA, and the following statements are defined in the related logic Rule: IF AI0>10mA, THEN DO=ON, ELSE DO=OFF, that means, when AI0 receives a signal that exceed 10mA, the DO channel will change to ON immediately, however, when the AI0 channel value drops and becomes lower than 10mA, the DO channel will not change back to OFF immediately until the value reaches 8mA (10mA minus the Deadband value 2mA), as shown in following figure.

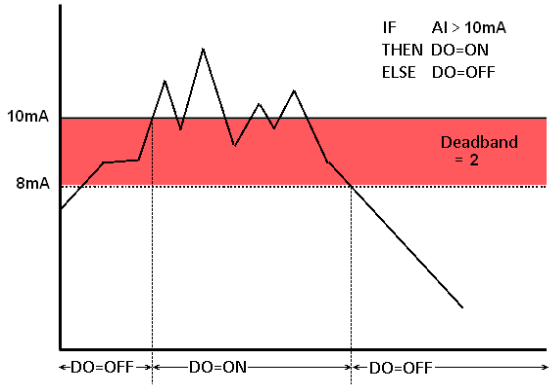



**Figure 4-10：AI Deadband Operation(> or >= a numerical value)**

(b) In the IF Condition, when AI < or <= a numerical value:

Assuming the Deadband value is set to be 2 mA, and the following statements are defined in the related logic Rule: IF AI0<10mA, THEN DO=ON, ELSE DO=OFF, that means, when AI0 receives a signal which is lower than 10mA, the DO channel will change to ON immediately, however, when the AI0 channel value exceed 10mA, the DO channel will not change back to OFF immediately until the value reaches 12mA (10mA plus the Deadband value 2mA), as shown in following figure.

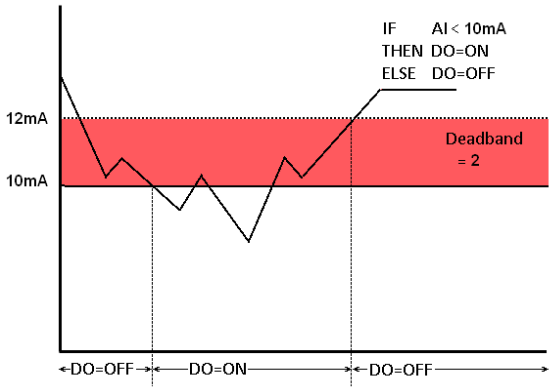



**Figure 4-11：AI Deadband Operation(< or <= a numerical value)**

(c) In the IF Condition, when AI = a numerical value:

Assuming the Deadband value is set to be 1 mA, and the following statements are defined in the related logic Rule: IF AI0 = 9mA, THEN DO=ON, ELSE DO=OFF, that means, when AI0 receives a signal between 8mA (9mA minus the deadband value 1mA) and 10mA (9mA plus the deadband value 1mA), the DO channel will change to ON immediately. However, when the AI0 channel value

exceed 10mA, or is lower than 8mA, the DO channel will change to OFF, as shown in following figure.

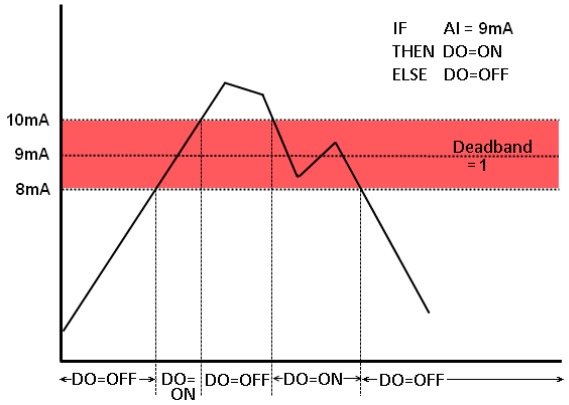



**Figure 4-12：AI Deadband Operation(= a numerical value)**

After all AI channel settings are completed, click “Save” button to save the changes.

### 4.5.4 XW-Board AO Channel Settings

The XW-Board AO Channel Setting page is shown as follow (using XW304 as an example):

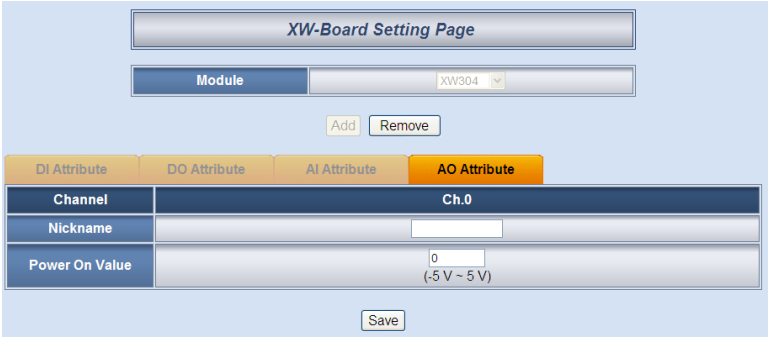



**Figure 4-13：XW-Board AO attribute setting page**

The settings are as follow:

- Nickname: For you to define nicknames for each I/O channel, this nickname will be displayed on the “Channel Status” page.
- You can set the initial value of the AO channel in the “Power On Value” field. WISE-580x will output this value for the AO channel when is power on. The default initial value is 0.

After all AO channel settings are completed, click “Save” button to save the changes.

## 4.6 I-7000 Modules Setting

I-7000 Modules Setting page allows you to select the module types of the I-7000 modules and DL-100/DL-302 connecting to the WISE-580x via COM2 and enables to set up the configuration for each individual I-7000 module. Each WISE-580x controller allows to connecting to up to 16 I-7000 modules. Module Address setting must be in the range 1~16. The I-7000 Modules Setting page is shown as below:

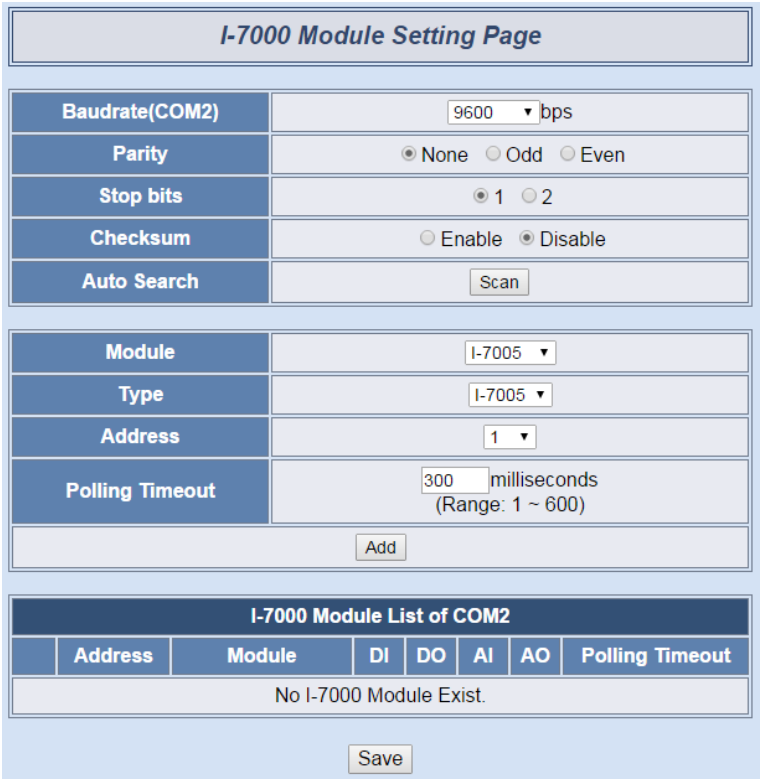



**Figure 4-14：I-7000 module setting page**

Follow the following steps:

- In the “Baudrate” field, select the WISE-580x COM2 data transmission rate from the drop down list.
- In the “Parity” and “Stop bits” fields, set up the Parity and Stop bits. The Parity and Stop bits of WISE-580x and I-7000 module have to be set the same.
- In the “Checksum” field, specify the Checksum setting for the communicate between WISE and I-7000 to be enabled or disabled. The default setting is “Disable”.
- In the “Auto Search” field, click on “Scan” button to search the

I-7000 modules that are connected to the controller via COM2. Please note: to ensure a proper connection, make sure when you use DCON Utility to set up the Baudrate, parity, stop bits and checksum for each I-7000 module, the Baudrate, parity, stop bits and checksum have to be set the same as WISE-580x settings(as previous setup) .

- In addition to "Auto Search", you can add the I-7000 module one by one; complete "Module", "Type", "Address" and "Polling Time" field and then click "Add" button to add a new I-7000 module. An example of the I-7000 module list is shown as below:

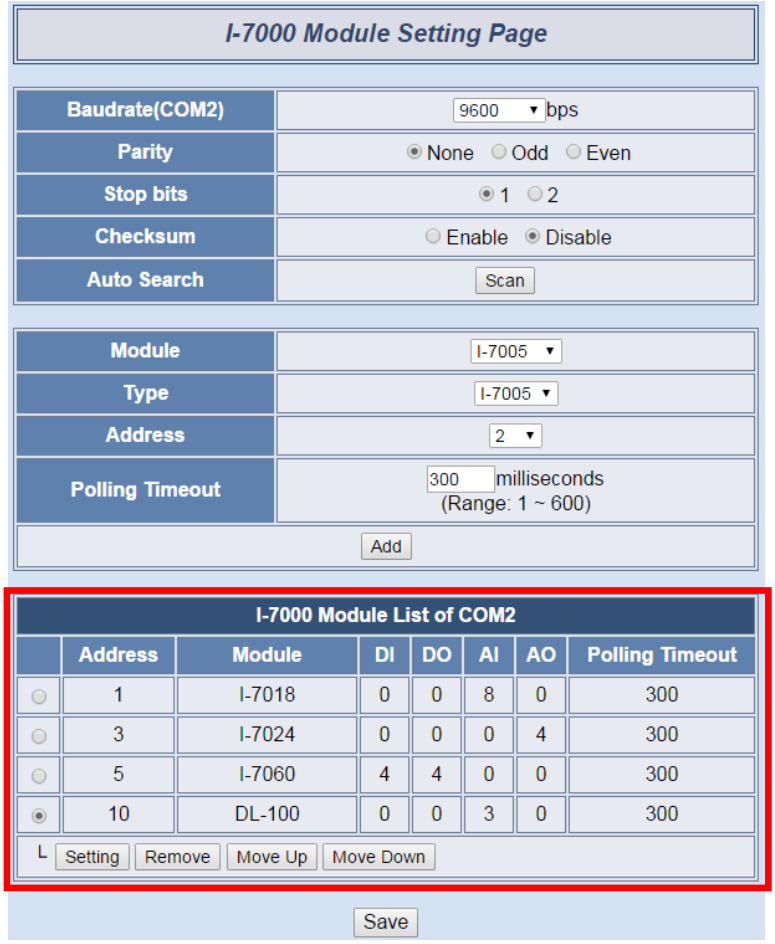



**Figure 4-15：I-7000 modules list**

- Select an I-7000 module and click on "Setting" button to edit detailed parameters for each module. To remove the I-7000 module, select the module you would like to remove and click "Remove" button to remove the specific module. To relocate I-7000 to other address, click "Move Up" or "Move Down" to move the I-7000 module to desired address.

- After all I-7000 module settings are completed, click “Save” button to save the changes

Please refer to the following sections for more detail on I-7000 module DI, DO, AI and AO channel configurations.

Please note:

1. Currently WISE-580x only connect to I-7000 via COM2, please make sure if the I-7000 modules are connected to WISE-580x COM2.
2. WISE-580x supports the Host Watchdog function to send a “Host OK” command to all connected I-7000 modules every 5 seconds.

### 4.6.1 I-7000 module DI channel setting

The I-7000 module DI Channel Setting page is shown as follow (using I-7052 as an example):

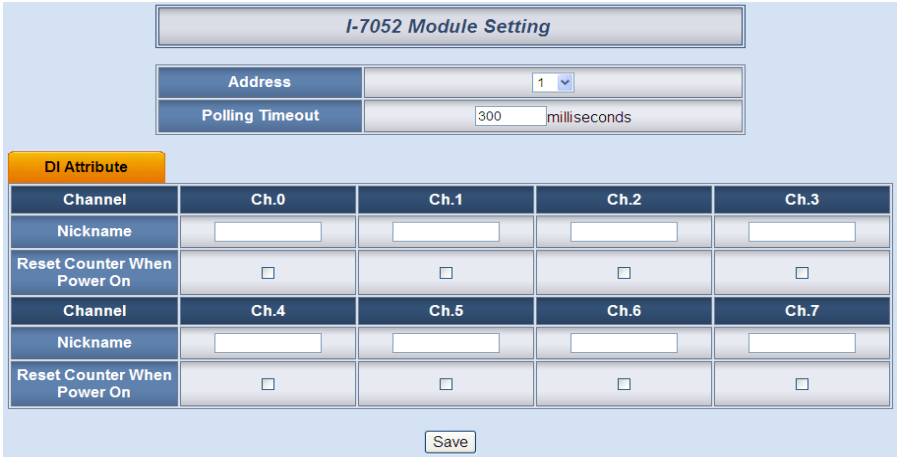



**Figure 4-16：I-7000 module DI attribute setting page**

The settings are as follow:

- Polling Timeout：The time for WISE-580x to send command to the I-7000 module and wait for the response, the unit will be ms.
- Nickname：For you to define nicknames for each I/O channel, this nickname will be displayed on the “Channel Status” page.
- Reset Counter When Power On：When the “Reset Counter When Power On” is selected, it means the system will reset the DI counter of this I-7000 module to the default value when WISE-580x power on.

After all DI channel settings are completed, click “Save” button to save the changes.

Please note: the DI channel counter of I-7000 module is counting by default Falling edge detection (ON-to-OFF), if you would like to select other counting type, please use DCON Utility to set up the counting type.

### 4.6.2 I-7000 module DO channel setting

I-7000 module DO Channel Setting page is shown as follow (using I-7060 as an example):

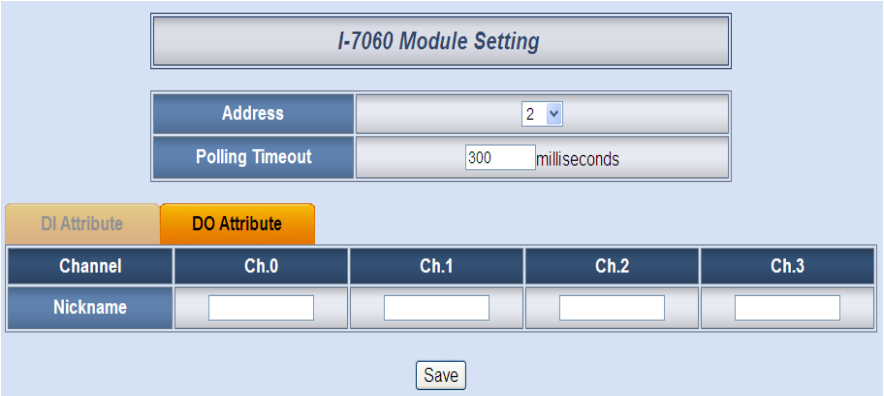



**Figure 4-17：I-7000 module DO attribute setting page**

The settings are as follow:

- Polling Timeout: The time for WISE-580x to send command to the I-7000 module and wait for the response, the unit will be ms.
- Nickname: For you to define nicknames for each I/O channel, this nickname will be displayed on the “Channel Status” page.

After all DO channel settings are completed, click “Save” button to save the changes.

Please note:

1. To setup the Power On Value on DO channel for each I-7000 module, please use the DCON Utility to setup the value.
2. The DO channels on I-7000 modules do not provide Pulse Output function.
3. The DO channels on I-7000 modules do not provide Counter function.

### 4.6.3 I-7000 module AI channel setting

I-7000 module AI Channel Setting page is shown as follow (using I-7018 as an example):

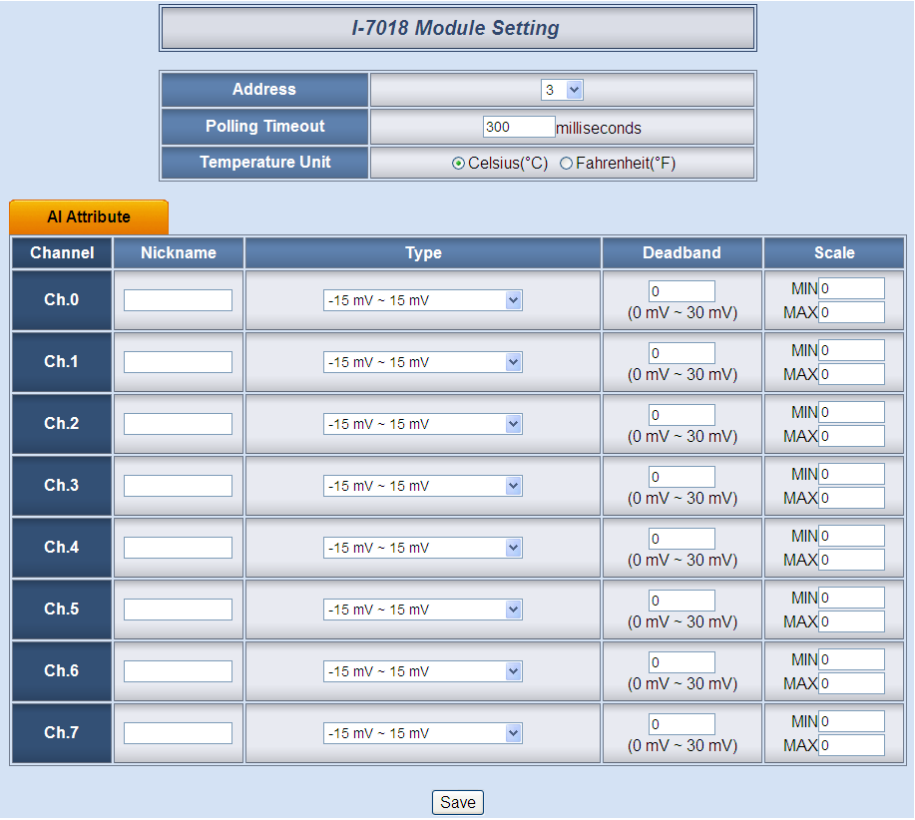



**Figure 4-18：I-7000 module AI attribute setting page**

The settings are as follow:

- Polling Timeout: The time for WISE-580x to send command to the I-7000 module and wait for the response, the unit will be ms.
- Temperature Unit: Specify temperature measurement unit for modules that allows for temperature measurement, such as I-7005, I-7011, I-7013, I-7015, I-7018 and I-7019, the temperature units can be set as degree Celsius or degree Fahrenheit.
- Nickname: For you to define nicknames for each I/O channel, this nickname will be displayed on the “Channel Status” page.
- Type：Select the appropriate AI signal input type.
- Deadband: Please refer to section 4.8 XW-Board AI channel settings for “Deadband” settings.
- Scale: Please refer to section 4.8 XW-Board AI channel settings for “Scale” settings.

After all AI channel settings are completed, click “Save” button to save the changes.

### 4.6.4 I-7000 module AO channel setting

I-7000 module AO Channel Setting page is shown as follow (using I-7024 as an example):

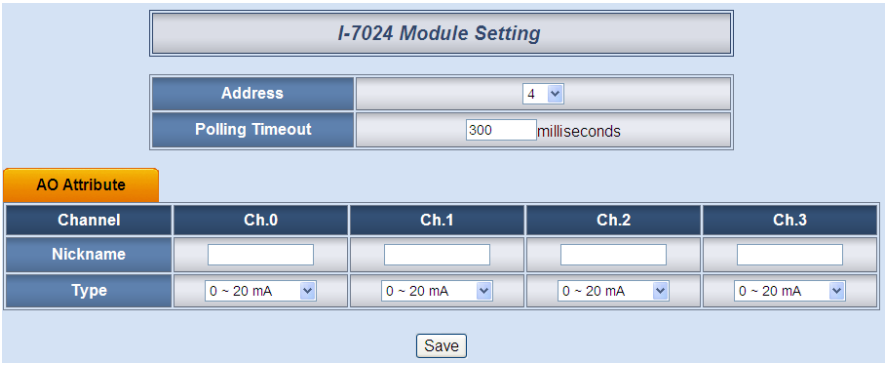



**Figure 4-19：I-7000 module AO attribute setting page**

The settings are as follow:

- Polling Timeout: The time for WISE-580x to send command to the I-7000 module and wait for the response, the unit will be ms.
- Nickname: For you to define nicknames for each I/O channel, this nickname will be displayed on the “Channel Status” page.
- Type: Select the appropriate AO signal output type.

After all AO channel settings are completed, click “Save” button to save the changes.

Please note: please use DCON Utility to set up the Power On Value for each AO channel on I-7000 modules.

## 4.7 Modbus RTU Modules Setting

In addition to XW-Board and I-7000 I/O modules, WISE-580x also allows to connect with devices that support Modbus RTU Slave protocol for I/O control. Through Modbus RTU protocol, it enables to read back 4 types of Modbus data (Coil Output, Discrete Input, Input Register and Holding Register) from the Modbus RTU Slave modules to the WISE-580x. And by WISE IF-THEN-ELSE rule engine, it allows to perform automation control operation on the devices. And with SCADA software, it also allows to

monitor and control the Modbus RTU device retrieved information on the WISE-580x.

In Modbus RTU Modules Setting page, it allows to perform parameters settings and related configuration of the Modbus RTU Slave modules for use in the IF-THEN-ELSE rules edition. Each WISE-58x can connect to either up to 4 or 10 Modbus RTU Slave modules - the maximum quantity it allows to connect to depends on the mode selected. The setting page is shown as follow:

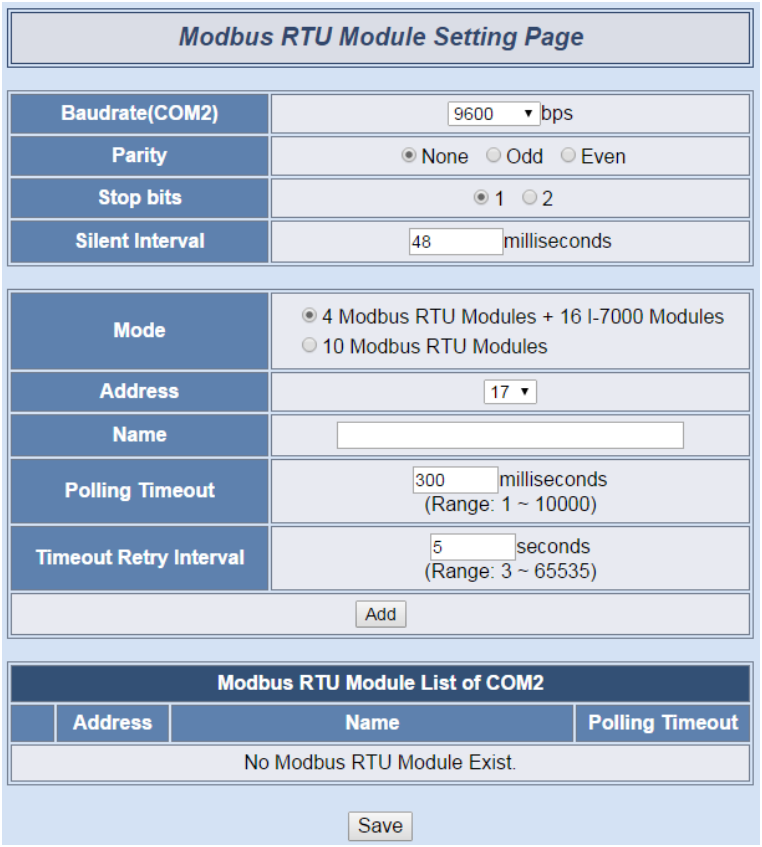



**Figure 4-20：Modbus RTU Slave Module Setting Page**

Follow the following steps:

i. In the “Baudrate(COM2)” field, select the WISE-580x COM2 data transmission Baudrate from the drop down list. The Baudrate has to be set the same as the Baudrate of Modbus RTU Slave modules. Please note: on the I-7000 Module Setting page, there is a COM2 Baudrate setting as well, please note that all I-7000 modules and Modbus RTU Slave modules that are connected to the WISE-580x COM2 must be set to the same Baudrate.

ii. In the “Parity” and “Stop bits” fields, set up the Parity and Stop bits.

The Parity and Stop bits of WISE-580x and Modbus RTU Slave module have to be set the same.

iii. Select the data transmission Baudrate for WISE-580x COM2, and then the system will automatically provide a proper value in the "Silent Interval" field. For each Modbus RTU Slave device has different Modbus command process capability, the response time for sending result from Modbus RTU Slave device to controller might be different. You can adjust this value to most appropriate time interval, such as: extend this value to make sure every Modbus RTU Slave device connected to the WISE-580x has enough time to process the Modbus command, or shorten this value to improve the efficient of the poll mechanism between Modbus RTU Slave device and WISE-580x.

iv. In the "Mode" field, select the I/O module connection mode for this WISE-580x. There are two options; if you select "4 Modbus RTU Modules + 16 I-7000 Modules", the address of the Modbus RTU Slave module has to be set between 17~20. If the option "10 Modbus RTU Modules" is selected, this WISE-580x is set to connect to Modbus RTU Slave modules only and the address of the Modbus RTU Slave module in this mode has to be set between 1~32.

v. In the "Address" field, select the correct address for the Modbus RTU Slave module. Please note: the configuration of the address must be the same as the Modbus RTU Slave module address setting.

vi. In the "Name" field, input the Modbus RTU Slave module name. This name will be used in IF-THEN-ELSE rule edition.

vii. Input the "Polling Timeout" field. The "Polling Timeout" indicates the time interval for WISE-580x to send command to the Modbus RTU Slave module and wait for the response, the unit is millisecond.

viii. Input the "Timeout Retry Interval" field. The "Timeout Retry Interval" indicates the time interval for WISE-580x to resend command to Modbus RTU Slave module when it's in the timeout status when performing communication between WISE-580x and Modbus RTU Slave module. The unit is second.

ix. After finish the settings of "Baudrate(COM2)", "Parity", "Stop bits", "Silent Interval", "Mode", "Address", "Name", "Polling Timeout" and "Timeout Retry Interval", click "Add" button. The new Modbus RTU Slave module will be added to the module list. The order of the Modbus RTU Slave module will vary according to the mode selected.

If you select the mode that supports 4 Modbus RTU modules, the Modbus RTU Slave modules will be added in the order of the address 17~20. If you select the mode that supports 10 Modbus RTU modules, the order of the Modbus RTU Slave module will correspond to the Index number the Modbus RTU module being assigned (not correspond to the RS-485 address). So before you add the module, you must assign a specific Index (1-10) to a specific Modbus RTU module. According to the Index being assigned, the I/O channel data of the module will be saved in the corresponding WISE-580x Modbus address table, for more detailed information, please refer to Appendix 1.

The following are examples of the Modbus RTU Slave module lists.

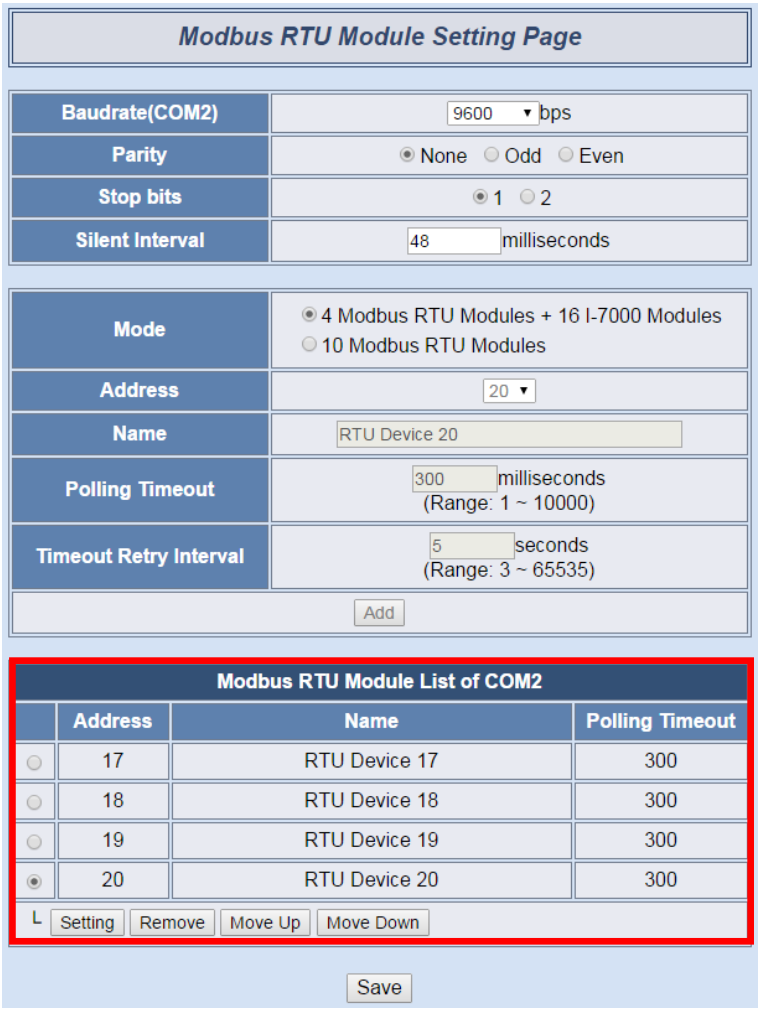



**Figure 4-21：Modbus RTU Slave Module List for "4 Modbus RTU Modules + 16 I-7000 Modules"**

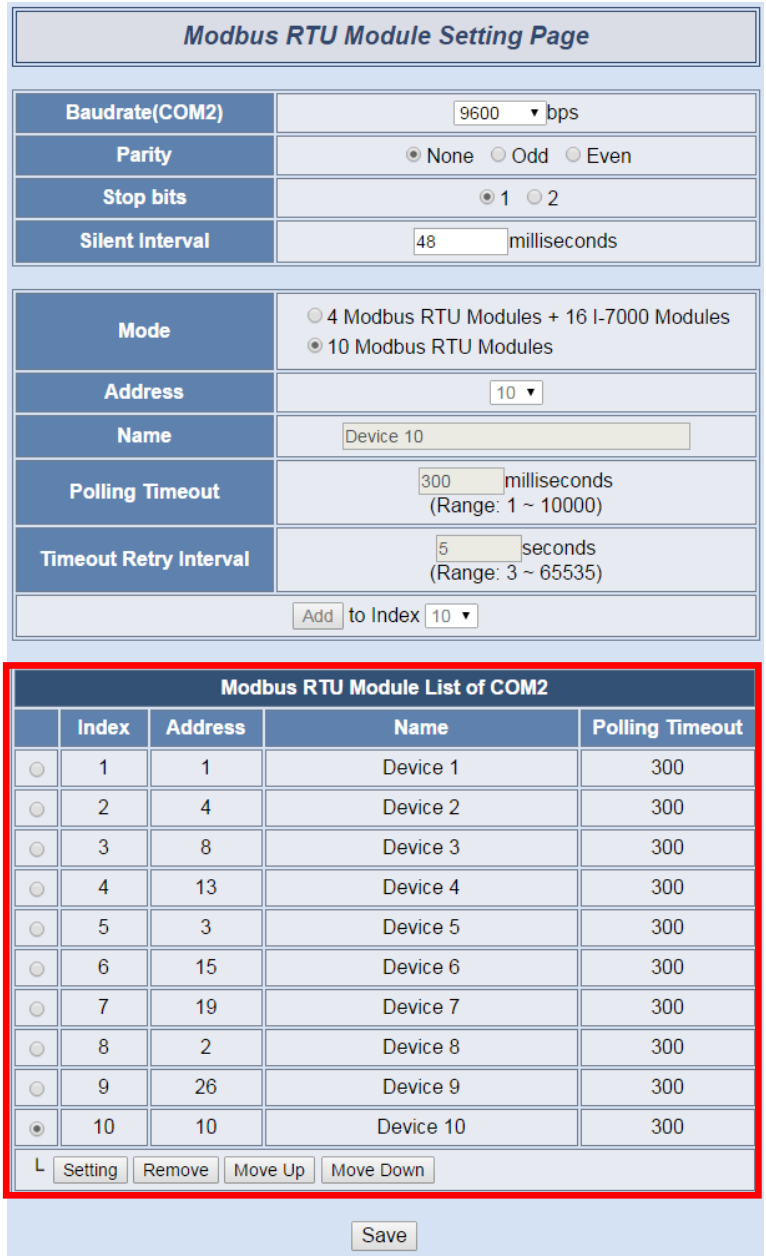



**Figure 4-22：Modbus RTU Slave Module List for “10 Modbus RTU Modules”**

x. Click on the Modbus RTU Slave module on the module list and click “Setting” button to get in to the Coil Output, Discrete Input, Input Register and Holding Register setting page to edit settings. To remove the Modbus RTU Slave module, select the module you would like to remove and click “Remove” button. To relocate Modbus RTU Slave to other address, click “Move Up” or “Move Down” to move the Modbus RTU Slave module to the desired address(for “4 Modbus RTU Modules + 16 I-7000 Modules” mode) or the desired Index(for “10 Modbus RTU Modules” mode).

xi. After all Modbus RTU Slave module settings are completed, click "Save" button to save the changes.

Please refer to the following sections for more detailed information of Coil Output, Discrete Input, Input Register and Holding Register configurations on Modbus RTU Slave module.

Please note:

i. Currently WISE-580x only allows to connect with Modbus RTU Slave module via COM2. Please make sure the Modbus RTU Slave modules are connected to COM2 on WISE-580x.

ii. The number of Modbus address setting blocks will affect the data update rate for the Modbus RTU Slave module. Please minimize the number of Modbus address setting blocks; merge the conjunctive setting blocks to speed up the data update rate for the communication between WISE-580x and Modbus RTU Slave module.

### 4.7.1 Modbus RTU Slave Module Coil Output Setting

The Modbus RTU Slave module Coil Output Setting page is shown as follow:

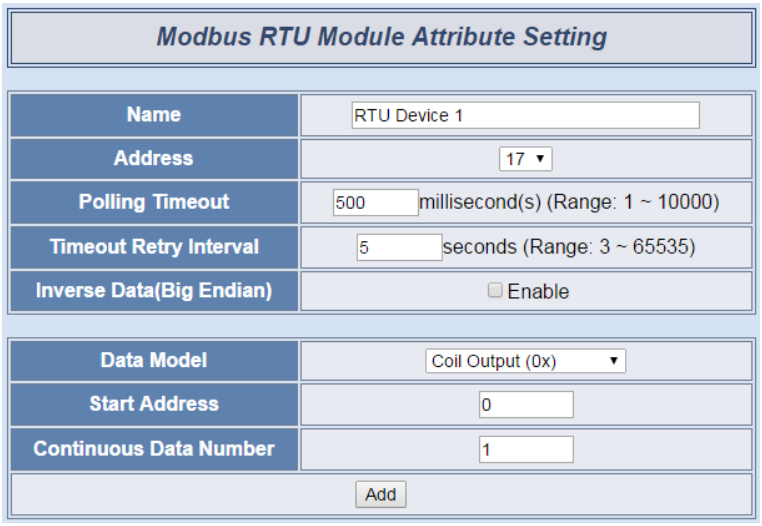



**Figure 4-23：Modbus RTU Slave Module Coil Output Setting Page**

The detailed information of the parameters are as follow:

- Please refer to section 4.7 for detailed information of the "Name", "Address", "Polling Timeout" and "Timeout Retry Interval" fields.
- Inverse Data(Big Endian): check "Enable" to receive the "32-bit

Signed Long", "32-bit Unsigned Long", or "32-bit Floating Point" data in Big Endian format correctly.

- Data Model: WISE-580x offers 4 Data Model selections to match the Modbus RTU Slave module configuration. The Data Model list is as follow. In this case, please select "Coil Output(0x)".

| Data Model | The Modbus Address of Modbus RTU Slave Modules |
|---|---|
| Coil Output | 0xxxx |
| Discrete Input | 1xxxx |
| Input Register | 3xxxx |
| Holding Register | 4xxxx |

- Start Address: Allows to set up the starting address of Coil Output (0x) on the Modbus RTU Slave module you would like to retrieve.
- Continuous Data Number: After finishing the Start Address setting, specify the Continuous Data Number, it is the number of Coil Output data you would like to retrieve from the Start Address. The maximum address number of each data type is 100.
- After finishing the "Start Address" and "Continuous Data Number" setting, click on "Add" button. A new Coil Output address block will be added to the Modbus address mapping table (shown as below). All added address blocks will be located in sequences staring from the Starting Address.

  Please note: The address number on the first column "WISE-580x Local Address" means the local Modbus address of WISE-580x to keep the retrieved Coil Output data.

  The following is an example about Coil Output setting for a Modbus RTU Slave module. The starting Modbus address of the Coil Output block is 00050(00000 + 50), it requires to set 4 continuous Coil Output data in the setting. So that the WISE-580x can access the 00050, 00051, 00052 and 00053 Coil Output address of the module, and these retrieved Coil Output data will be kept in WISE-580x Modbus Address 00780, 00781, 00782 and 00783.

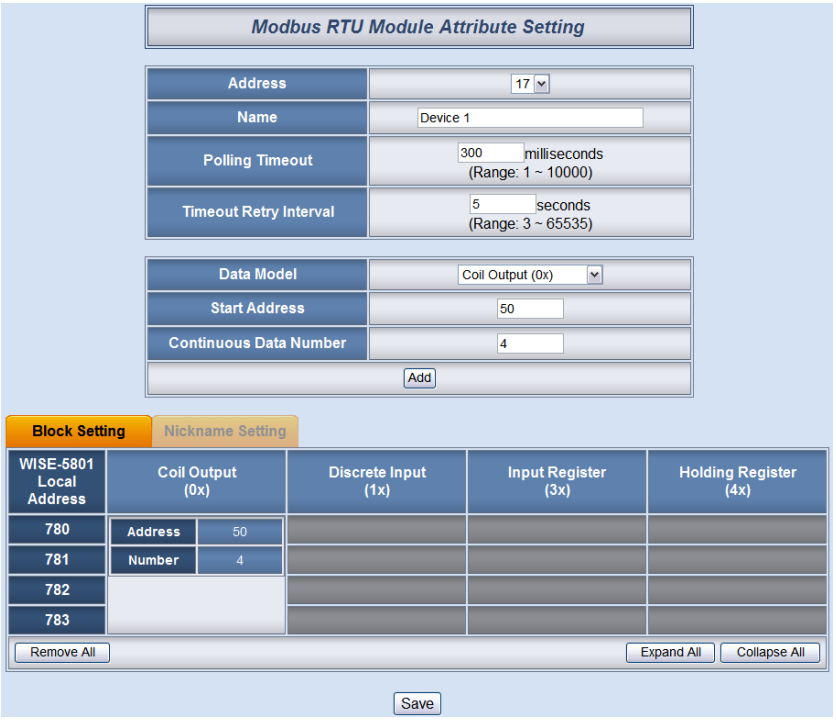
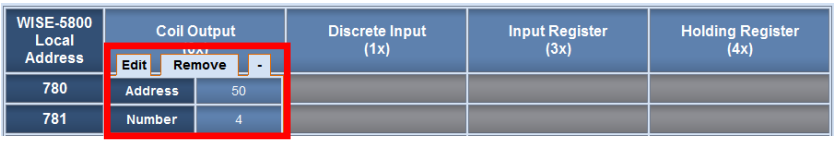
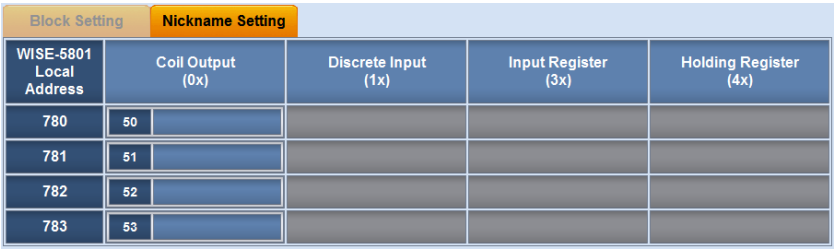



**Figure 4-24：Modbus RTU Slave Module Coil Output Setting Example**

- To modify the starting address or quantity setting, please move the cursor to the setting, the function buttons such as “Edit” or “Remove” will appear. Click “Edit” or “Remove” for modification.




- If you want to assign the Nickname for the address blocks, you can click the “Nickname Setting” tab, and then input the Nickname for each address block. The Nickname will be shown in the “Channel Status” page.




- After all Coil Output settings of the Modbus RTU Slave module are completed, click “Save” button to save the changes.

### 4.7.2 Modbus RTU Slave Module Discrete Input Setting

The Modbus RTU Slave module Discrete Input Setting page is shown as follow:

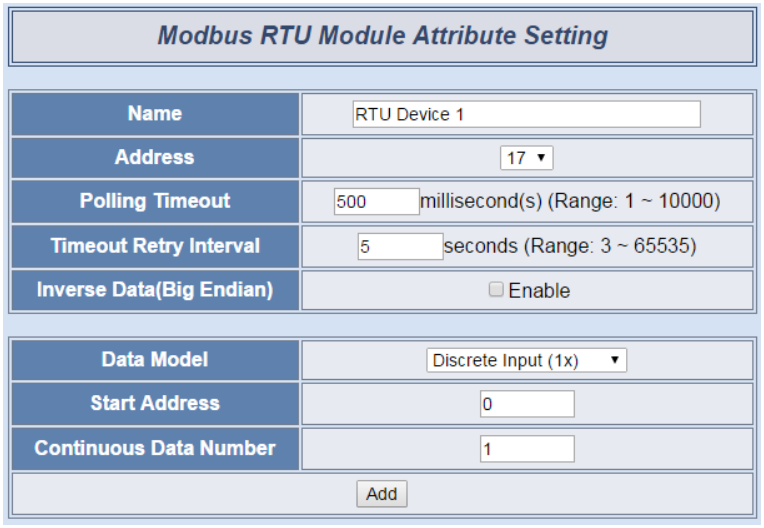



**Figure 4-25：Modbus RTU Slave Module Discrete Input Setting Page**

The detailed information of the parameters are as follow:

- Please refer to section 4.7.1 for detailed information of the “Name”, “Address”, “Polling Timeout”, “Timeout Retry Interval” and “Inverse Data(Big Endian)” fields.
- Data Model: WISE-580x offers 4 Data Model selections to match the Modbus RTU Slave module configuration. Please refer to the section 4.7.1 for detailed information. In this case, please select ”Discrete Input(1x)”.
- Start Address: Allows to set up the starting address of Discrete Input(1x) on the Modbus RTU Slave module you would like to retrieve.
- Continuous Data Number: After finishing the Start Address setting, specify the Continuous Data Number, it is the number of Discrete Input data you would like to retrieve from the Start Address. The maximum address number of each data type is 100.
- After finishing the “Start Address” and “Continuous Data Number” setting, click on “Add” button. A new Discrete Input address block will be added to the Modbus address mapping table (shown as below). All added address blocks will be located in sequences staring from the Starting Address.

  Please note: The address number on the first column “WISE-580x

Local Address" means the local Modbus address of WISE-580x to keep the retrieved Discrete Input data.

The following is an example about Discrete Input setting for a Modbus RTU Slave module. The starting Modbus address of the Discrete Input block is 10020(10000 + 20), it requires to set 6 continuous Discrete Input data in the setting. So that the WISE-580x can access the 10020, 10021, 10022, 10023, 10024, and 10025 Discrete Input address of the module, and these retrieved Discrete Input data will be kept in WISE-580x Modbus Address 10780, 10781, 10782, 10783, 10784 and 10785.

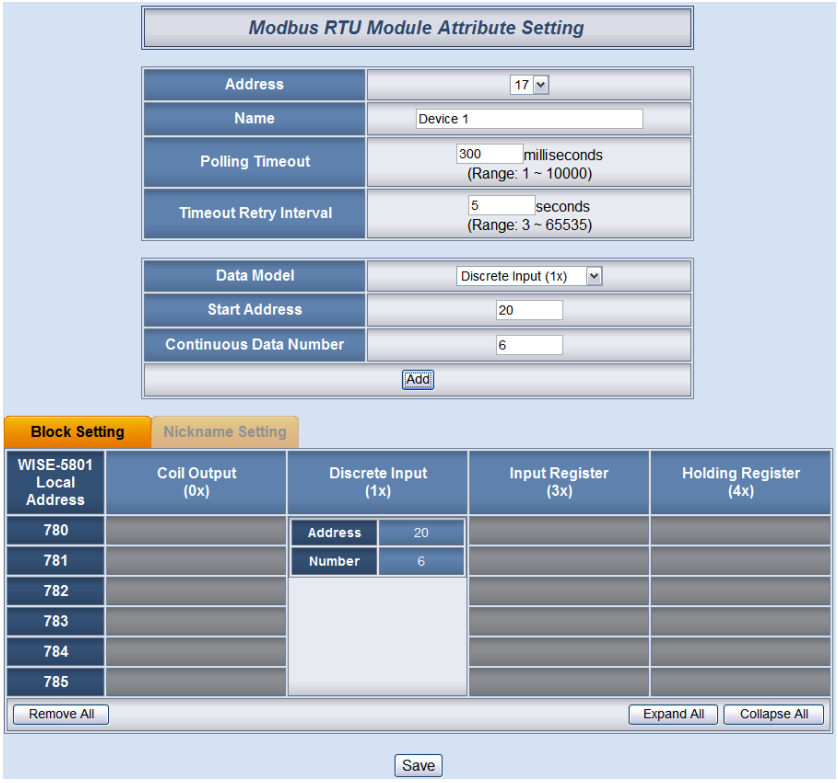
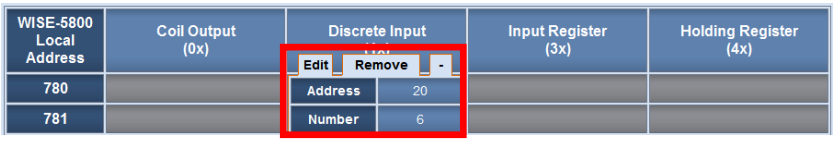


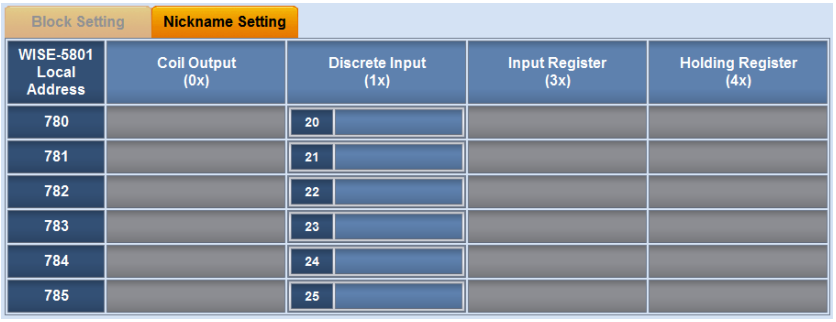

**Figure 4-26：Modbus RTU Slave Module Discrete Input Setting Example**

- To modify the starting address or quantity setting, please move the cursor to the setting, the function buttons such as "Edit" or "Remove" will appear. Click "Edit" or "Remove" for modification.




- If you want to assign the Nickname for the address blocks, you

can click the “Nickname Setting” tab, and then input the Nickname for each address block. The Nickname will be shown in the “Channel Status” page.




- After all Discrete Input settings of the Modbus RTU Slave module are completed, click “Save” button to save the changes.

### 4.7.3 Modbus RTU Slave Module Input Register Setting

The Modbus RTU Slave module Input Register Setting page is shown as follow:

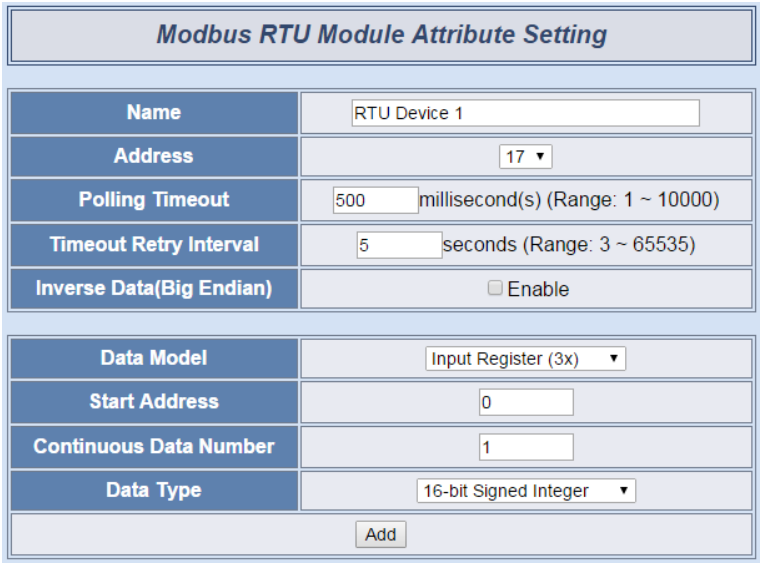



**Figure 4-27：Modbus RTU Slave Module Input Register Setting Page**

The detailed information of the parameters are as follow:

- Please refer to section 4.7.1 for detailed information of the “Name”, “Address”, “Polling Timeout”, “Timeout Retry Interval” and “Inverse Data(Big Endian)” fields.
- Data Model: WISE-580x offers 4 Data Model selections to match the Modbus RTU Slave module configuration. Please refer to the

section 4.7.1 for detailed information. In this case, please select ”Input Register(3x)”.

- Start Address: Allows to set up the starting address of Input Register(3x) on the Modbus RTU Slave module you would like to retrieve.
- Continuous Data Number: After finishing the Start Address setting, specify the Continuous Data Number, it is the number of Input Register data you would like to retrieve from the Start Address. The maximum address number of each data type is 100.
- Data Type: WISE-580x support 6 kinds of data type setting for Input Register of Modbus RTU Slave module. The 6 Data Type options are “16-bit Signed Integer”, “16-bit Unsigned Integer”, “16-bit Hex”, “32-bit Signed Long”, “32-bit Unsigned Long”, and “32-bit Floating Point”. If the “16-bit HEX” option is selected, please input the HEX max/min values and the Real max/min values for linear transformation.

- After finishing the “Start Address”, “Continuous Data Number”, and “Data Type” setting, click on “Add” button. A new Input Register address block will be added to the Modbus address mapping table(shown as below). All added address blocks will be located in sequences staring from the Starting Address.
  Please note: The address number on the first column “WISE-580x Local Address” means the local Modbus address of WISE-580x to keep the retrieved Input Register data.

The following is an example about Input Register setting for a Modbus RTU Slave module. The starting Modbus address of the Input Register block is 30010(30000 + 10), it requires to set 3 continuous Input Register data in the setting, and the data type is “32-bit Floating Point”. So that the WISE-580x can access the 30010, 30012, and 30014 Input Register address of the module, and these retrieved Input Register data will be kept in WISE-580x Modbus Address 30780, 30782, and 30784.

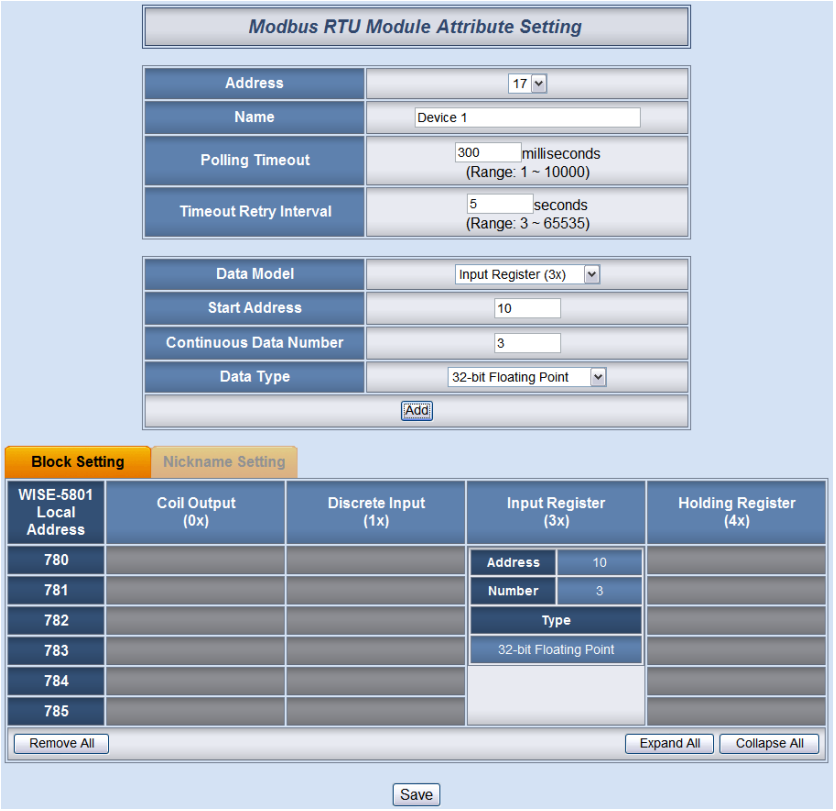
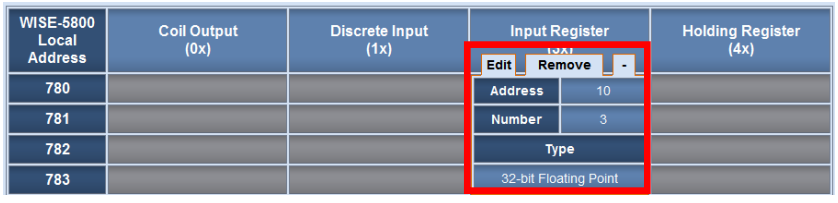


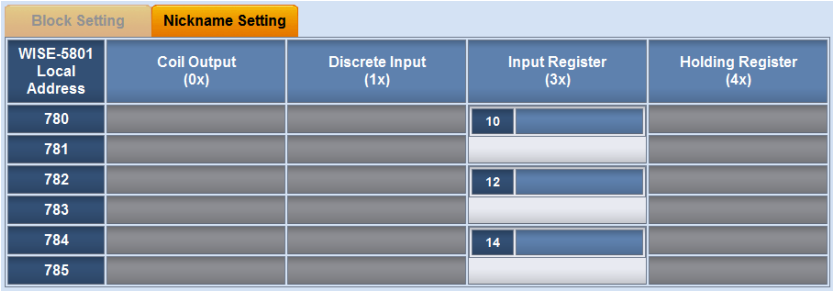

**Figure 4-28：Modbus RTU Slave Module Input Register Setting Example**

Please note: If the "Data Type" is set as "16-bit HEX", the retrieved HEX data from Modbus RTU Slave module would be transformed to floating point automatically, and these transformed data can be used in IF-THEN-ELSE rule setting.

- To modify the starting address or quantity setting, please move the cursor to the setting, the function buttons such as "Edit" or "Remove" will appear. Click "Edit" or "Remove" for modification.




- If you want to assign the Nickname for the address blocks, you can click the "Nickname Setting" tab, and then input the Nickname for each address block. The Nickname will be shown in the "Channel Status" page.




- After all Input Register settings of the Modbus RTU Slave module are completed, click “Save” button to save the changes.

### 4.7.4 Modbus RTU Slave Module Holding Register Setting

The Modbus RTU Slave module Holding Register Setting page is shown as follow:

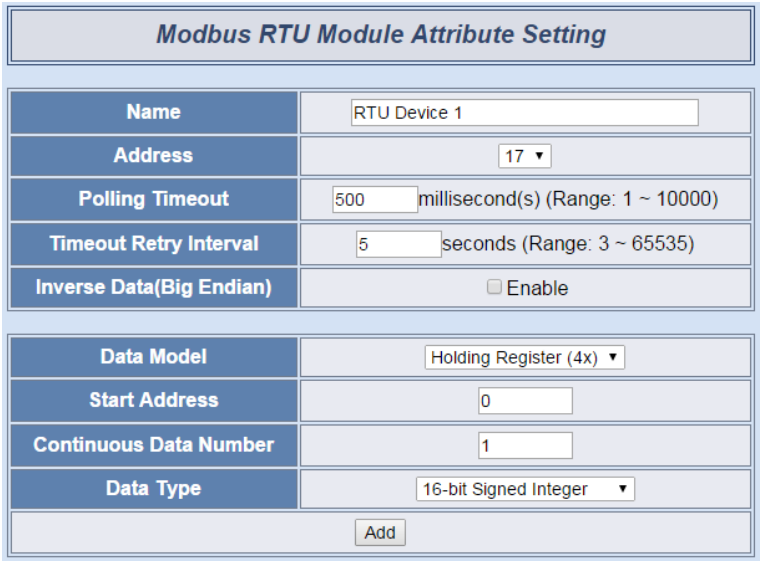



**Figure 4-29：Modbus RTU Slave Module Holding Register Setting Page**

The detailed information of the parameters are as follow:

- Please refer to section 4.7.1 for detailed information of the “Name”, “Address”, “Polling Timeout”, “Timeout Retry Interval” and “Inverse Data(Big Endian)” fields.
- Data Model: WISE-580x offers 4 Data Model selections to match the Modbus RTU Slave module configuration. Please refer to the section 4.7.1 for detailed information. In this case, please select ”Holding Register(4x)”.
- Start Address: Allows to set up the starting address of Holding Register(4x) on the Modbus RTU Slave module you would like to

retrieve.

- Continuous Data Number: After finishing the Start Address setting, specify the Continuous Data Number, it is the number of Holding Register data you would like to retrieve from the Start Address. The maximum address number of each data type is 100.
- Data Type: WISE-580x support 6 kinds of data type setting for Holding Register data of Modbus RTU Slave module. The 6 Data Type options are "16-bit Signed Integer", "16-bit Unsigned Integer", "16-bit Hex", "32-bit Signed Long", "32-bit Unsigned Long", and "32-bit Floating Point". If the "16-bit HEX" option is selected, please input the HEX max/min values and the Real max/min values for linear transformation.

- After finishing the "Start Address", "Continuous Data Number", and "Data Type" setting, click on "Add" button. A new Holding Register address block will be added to the Modbus address mapping table(shown as below). All added blocks will be located in sequences staring from the Starting Address.
  Please note: The address number on the first column "WISE-580x Local Address" means the local Modbus address of WISE-580x to keep the retrieved Holding Register data.

  The following is an example about Holding Input Register setting for a Modbus RTU Slave module. The starting Modbus address of the Holding Register block is 40060(40000 + 60), is requires to set 2 continuous Holding Register data in the setting, and the data type is "32-bit Floating Point". So that the WISE-580x can access the 40060 and 40062 Holding Register address of the module, and these retrieved Holding Register data will be kept in WISE-580x Modbus Address 40780 and 40782.

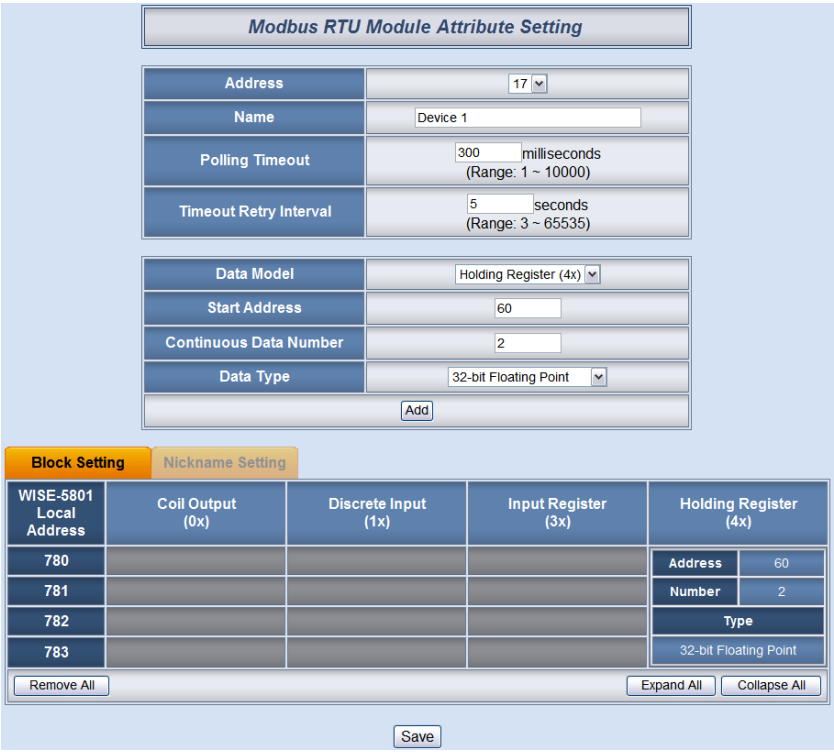
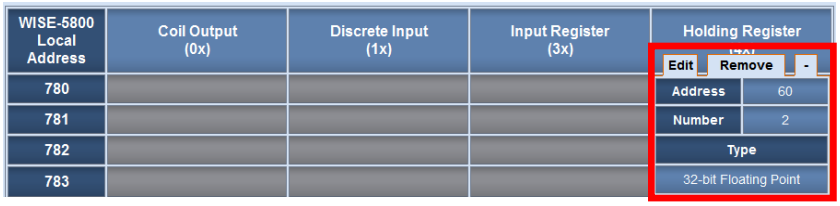


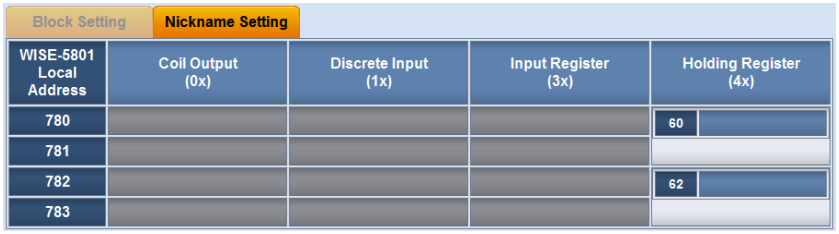

**Figure 4-30：Modbus RTU Slave Module Holding Register Setting Example**

Please note: If the "Data Type" is set as "16-bit HEX", the retrieved HEX data from Modbus RTU Slave module would be transformed to floating point automatically, and these transformed data can be used in IF-THEN-ELSE rule setting.

- To modify the starting address or quantity setting, please move the cursor to the setting, the function buttons such as "Edit" or "Remove" will appear. Click "Edit" or "Remove" for modification.




- If you want to assign the Nickname for the address blocks, you can click the "Nickname Setting" tab, and then input the Nickname for each address block. The Nickname will be shown in the "Channel Status" page.




- After all Holding Register settings of the Modbus RTU Slave module are completed, click “Save” button to save the changes.

# 5 Advanced Setting

Advanced Setting provides additional features and allows you to perform more setting on hardware devices. Click the Advanced Setting button, a column of buttons will appear on the left of the page:

- Internal Register Setting
- Timer Setting
- Schedule Setting
- Email Setting
- CGI Setting
- Recipe Setting
- Data Logger Setting
- Active I/O Setting
- SMS Setting (Apply to WISE-5801 only)

Please note: In order to avoid possible error when performing rule definition (IF-THEN-ELSE), please always finish configuration in Advanced Setting before starting to define Rules. Avoid unnecessary change in Advanced Setting after you finish rule definition. Unexpected errors might occur if you violate this sequence: Advanced Setting→ Rule Setting. In case you make any modification, please double check your settings and Rules definition to make sure no errors are present.

The following sections will describe more detailed information for these configurations.

## 5.1 Internal Register Setting

WISE provides 48 Internal Registers; they can be used to hold temporary variables and to read/write data via Modbus address. The configuration page is shown as follow.

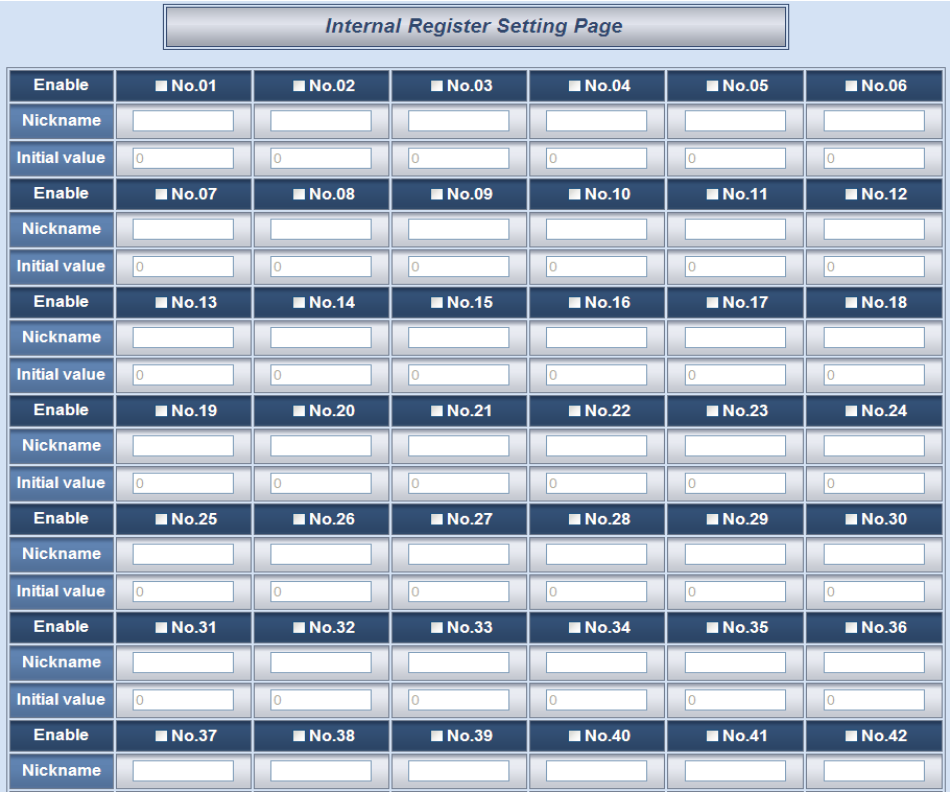



**Figure 5-1：Internal Register setting page**

The settings are as following steps:

i. A checkbox appears in front of each Internal Register; check the checkbox to enable the Internal Register. Input a value if you want to set a default value for the Internal Register, and set the nicknames for the Internal Register, this nickname will be displayed on the "Channel Status" page.

ii. After you finish all the Internal Registers selections and settings, click "Save" button to save the settings.

## 5.2 Timer Setting

WISE provides 12 groups Timer for timing functions. The Timer status can be "Not Timeout" or "Timeout". They can be included in the IF Condition statements. The Timer Action can be "Start" or "Reset". The Start Action will start to run the Timer and if the Start Action is triggered one more time when the Timer is running, the Timer will restart again. The Reset action will reset the Timer and stop running the Timer. The Timer will be in "Timeout" status only when the Timer is running and reached the setting time, otherwise, the status of Timer will remain in "Not Timeout". The

Timer setting interface is shown as below:

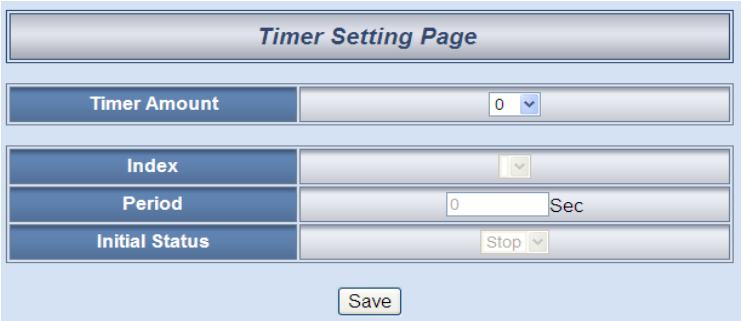



**Figure 5-2：Timer setting page**

Follow the following steps:

i. "Timer Amount" field is required. Select the total number of timer you are going to use from the dropdown list.

ii. Specify the timer you want to set up by selecting its index number from the dropdown list of the "Index" field.

iii. "Period" field is required for each timer; please input the period interval in units of seconds.

iv. Specify the initial status of each timer from the dropdown list of the "Initial Status" field. Select "Start" indicates the timer will start to count as soon as the hardware device is power up. "Stop" indicates the Timer will remain off when the hardware device is power up; it will not be activated until being triggered under certain conditions. The default setting of initial Status is "Stop".

v. Repeat steps ii ~ iv. After all timer settings are completed, click "Save" button to save the changes.

## 5.3 Schedule Setting

WISE provides 12 groups of Schedules to setup prescheduled routine tasks. The status of Schedule function can be "In Range" or "Out of Range", they can be included in the IF Condition statements. The Action of Schedule can be "Enable" or "Disable". Please note, if the Schedule is disabled, the status will be "Out of Range". Schedule setting page is shown as below:

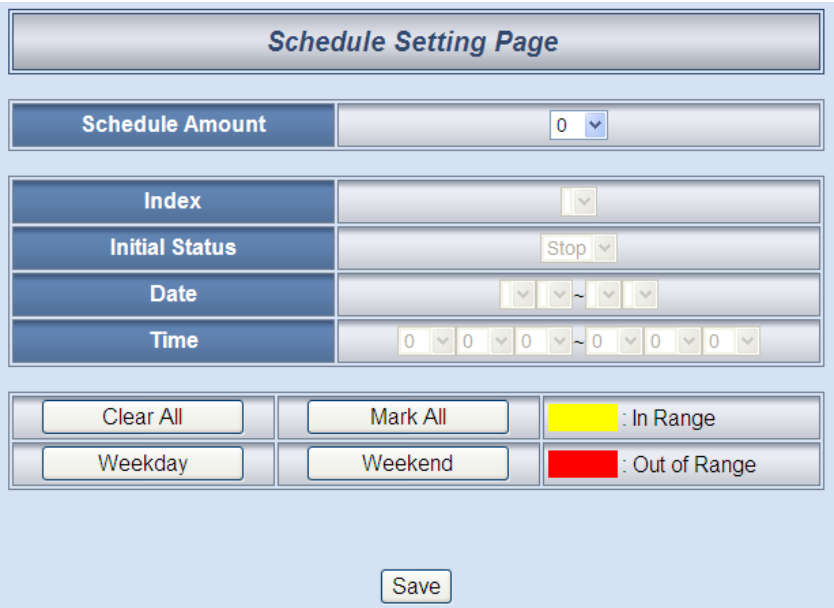



**Figure 5-3：Schedule setting page**

Follow the following steps:

i. Select the total number of schedule you are going to use from the dropdown list of the “Schedule Amount” field.

ii. Specify the schedule you want to set up by selecting its index number from the dropdown list of the “Index” field.

iii. Specify the initial status of each schedule from the dropdown list of the “Initial Status” field. “Start” indicates the schedule will be activated as soon as the hardware device is power up. “Stop” indicates the schedule will remain inactive when the hardware device is power up, it will not be activated until being triggered under certain conditions.

iv. Set up the Year and Month for this Schedule execution duration. After you specify the Year and Month in the Date section, the calendars corresponding to the Year and Month you specified will appear as shown below:

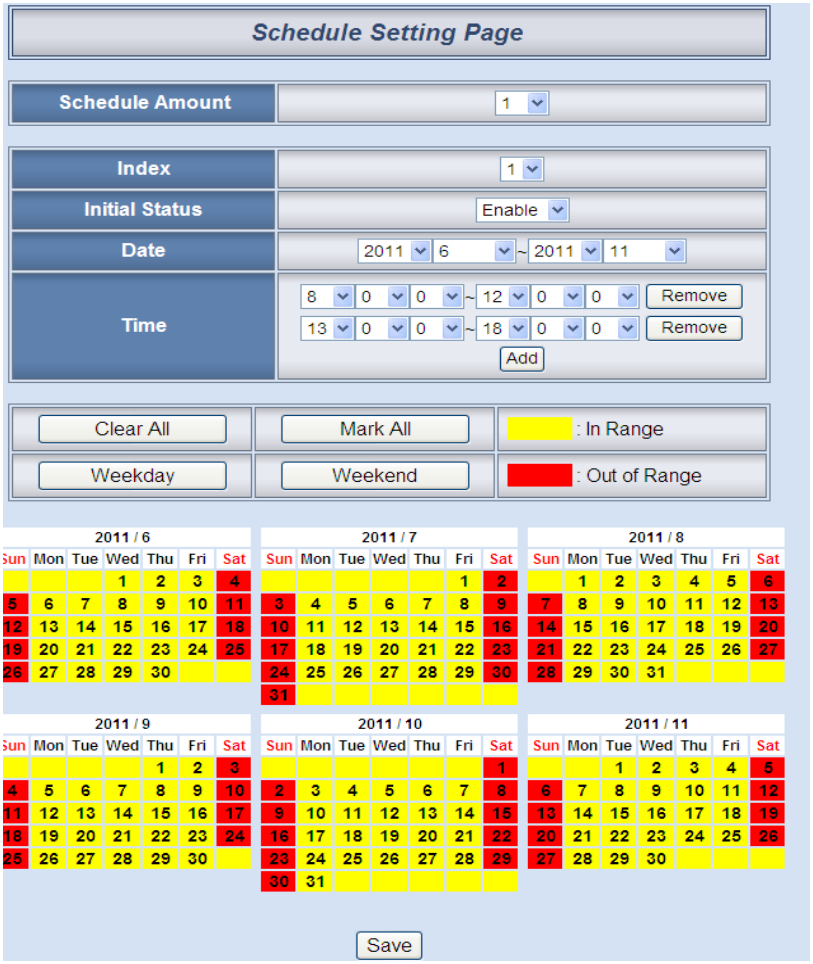



**Figure 5-4：Schedule Calendar setting page**

v. In the Time field, input the schedule "In Range" time. You can input up to 12 time zones in a specific date. Select the start time and the end time from the dropdown list. Click "Add" button to add a new time zone. Please note: the time zones you specified can't be overlapped. If you specify an end time that is earlier than the start time, such as 20:00:00 ~ 06:00:00, it indicates the end time will be set one day after the start date.

vi. On the calendars, click to toggle highlight on the dates you'd like to execute or not execute the operations for this Schedule. If the date shows a yellow background, it indicates the date is "In Range", that is, that date falls into the range that will execute the operations. On the contrary, if the date shows a red background, it indicates that date is "Out of Range", that is, that date falls out of the range and will not execute the operations. By default, all dates will be "In Range", that is, during the date range you select, the operation will be executed every day. Clear All button is used to reset all dates to be "In Range";

whereas Mark All button is for marking all dates to be "Out of Range". The Weekday button is for you to select all Mondays to Fridays to be "In Range", and Saturdays and Sundays to be "Out of Range", that is, the operations will be executed during weekdays only. On the contrary, the Weekend button is for you to set all Saturdays and Sundays to be "In Range", and all Mondays to Fridays to be "Out of Range", that is, the operations will be executed during weekends only.

vii. Repeat steps ii ~ vi. After all schedule settings are completed, click "Save" button to save the changes.

## 5.4 Email Setting

WISE supports up to 12 Email messages. This function allows sending pre-input Email message(s) to pre-set Email receiver(s) under certain conditions. The configuration page is shown as below:

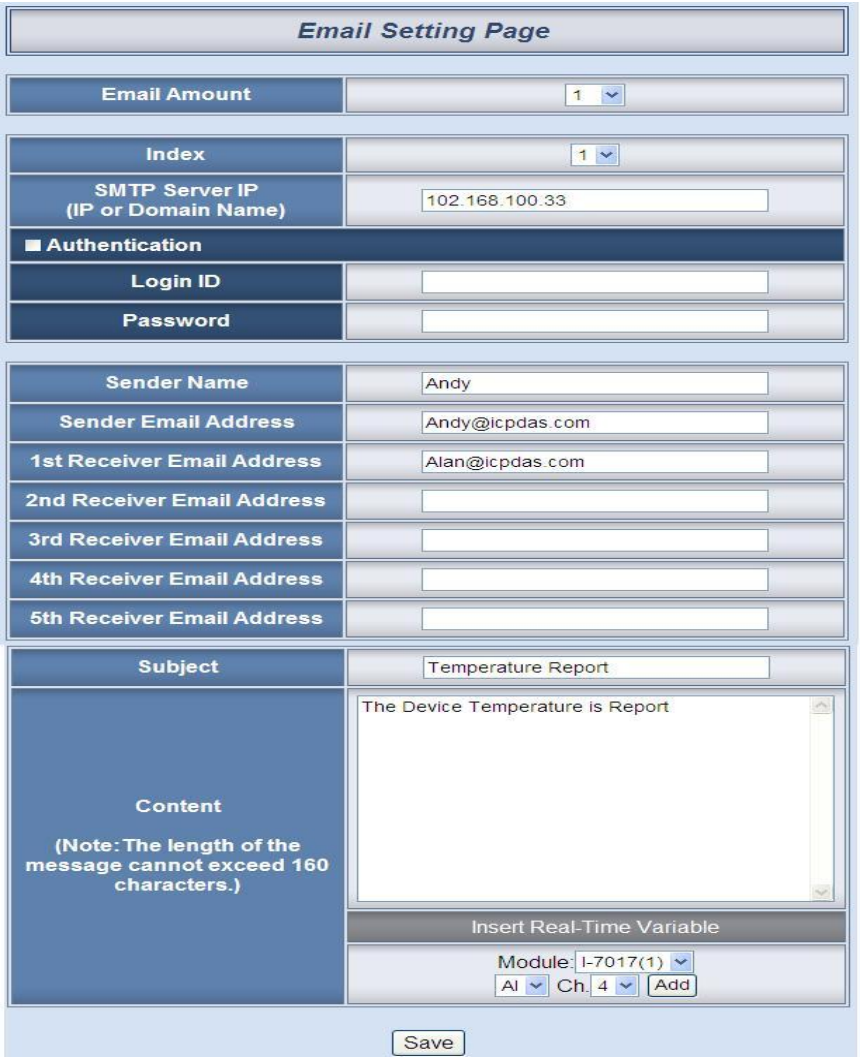



**Figure 5-5：Email setting page**

Follow the following steps:

i. Specify the numbers of email messages you want to set up from the dropdown list of the “E-mail Amount” field.

ii. Specify the email group number from the dropdown list of the “Index” field.

iii. Enter the IP or the domain name of the SMTP server in the “SMTP Server” field.

iv. If SMTP server requires account and password validation, please select the Authentication Checkbox, and continue steps v~vi to login into the SMTP server. If SMTP server don’t need account and password validation, uncheck the Authentication Checkbox and skip steps v~vi, go directly to step vii.

v. Enter the SMTP server login ID in the “Login ID” field.

vi. Enter the SMTP server password in the “Password” field.

vii. Enter the sender’s name in the “Sender Name” field.

viii. Enter the sender’s email address in the “Sender Email Address” field.

ix. Enter the receiver’s email address in the “1st ~5th Receiver Email address” field. Please note: you can input up to 5 receivers, at least one email address has to be entered. Please enter the email address in sequence to avoid possible error.

x. Enter the email subject in the “Subject” field.

xi. Enter the content in the “Content” field. The length of the content cannot exceed 160 characters. In addition, Email provides an encoded string for you to add current channel value into Email content. You can use the I/O channel selection interface (shown as below) to add channel value encoded string into the Email content.

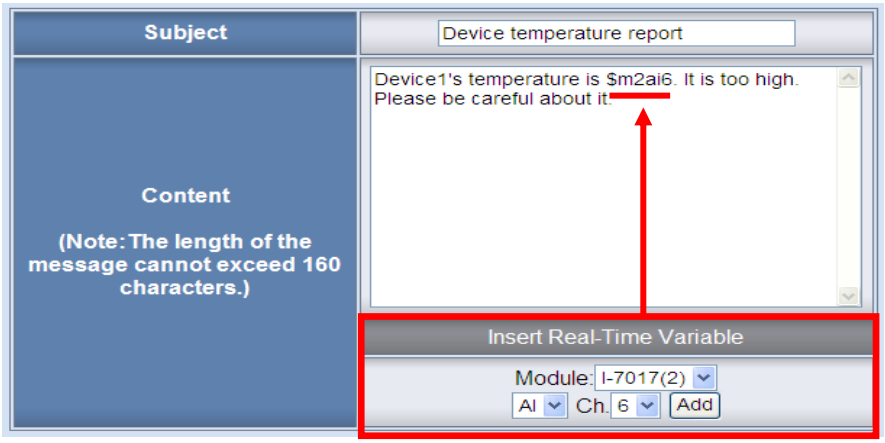

Subject
Device temperature report
Content
(Note: The length of the message cannot exceed 160 characters.)
Device1's temperature is $m2ai6. It is too high. Please be careful about it.
Insert Real-Time Variable
Module: I-7017(2)
AI Ch. 6 Add

**Figure 5-6：Email encoded string setting**

xii. Repeat steps ii ~ xi. After all email groups settings are completed, click “Save” button to save the changes.

**Please note: WISE-580x Email sending function can only work with the SMTP Email server that uses port 25 and must be without SSL cryptographic protocols. A self-hosted SMTP server is recommended for Email sending function. Please visit WISE FAQ web page (http://wise.icpdas.com/FAQ.html) for more Email setting information.**

## 5.5 CGI Command Setting

WISE offers up to 12 sets of CGI Command setting. This function allows sending pre-input CGI Command to pre-set Remote Server device under certain conditions. The configuration page is shown as below:

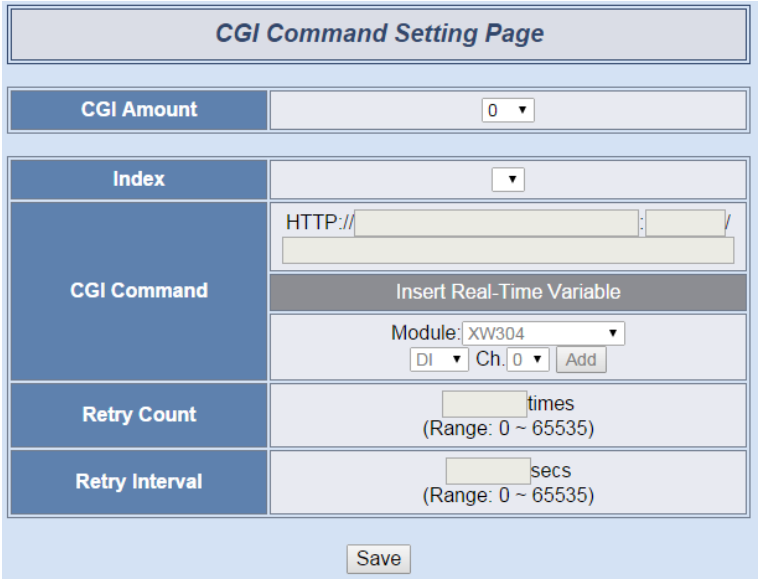



**Figure 5-7：CGI Command setting page**

Follow the following steps:

i. Specify the numbers of CGI Commands you want to set up from the dropdown list of the “CGI Amount” field.

ii. Specify the CGI group number from the dropdown list of the “Index” field.

iii. Enter the Remote Server IP(or domain name), Port number and CGI Command in the “CGI Command” field. CGI Command provides an encoded string for you to add current channel value into CGI Command. Please note: the content length of the CGI

command cannot exceed 400 characters.

iv. Enter the number in the “Retry Count” field. It means the retry number WISE will try when it can’t connect with Remote Server device.

v. Enter the number in the “Retry Interval” field. It means the time interval between each retry connection. The unit is Second.

vi. Repeat steps ii ~ v. After all CGI groups settings are completed, click “Save” button to save the changes.

## 5.6 Recipe Setting

WISE offers up to 12 sets of Recipe setting. A sequence of actions can be stored and saved in a Recipe, you can setup to execute this sequence of actions that was previously stored in the Recipe when an IF condition is matched. A Recipe contains a sequence of actions, therefore, we can say a Recipe is a macro for Actions. The configuration page for Recipe Setting is shown as below:

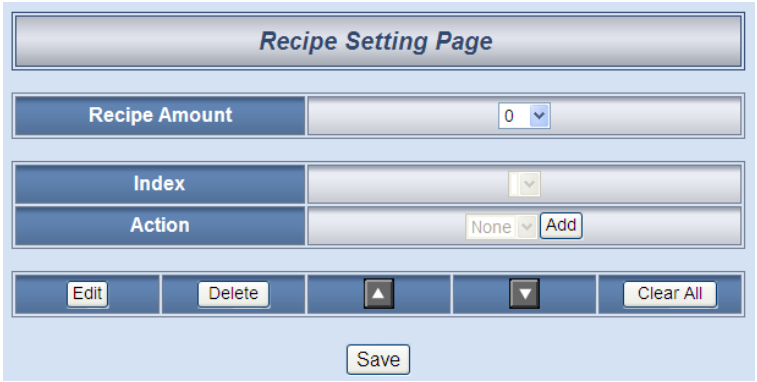



**Figure 5-8：Recipe setting page**

Follow the following steps:

i. Select the total number of Recipe you are going to use from the dropdown list of the Recipe Amount field.

ii. Assign an index number to the Recipe from the dropdown list of the “Index” field.

iii. Select an Action type from the dropdown list of the Action field.

iv. Click the Add button. An Action Setting page will appear for you to set up related Action Settings, please refer to THEN/ELSE Action.

v. After you finish setting up Action Settings, the page will refresh automatically and the Actions will be listed on Recipe.

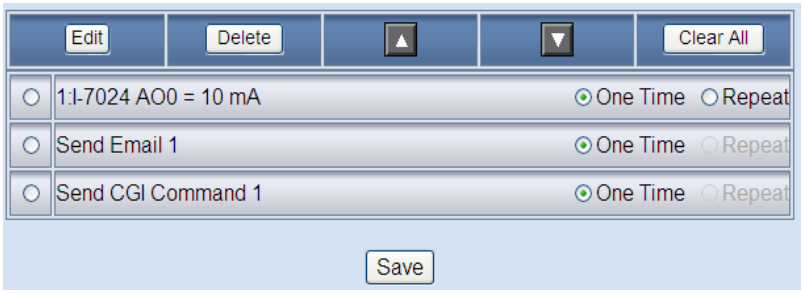



**Figure 5-9：Recipe Action Management**

In order to meet application requirement, for some Actions, WISE offers options to execute the Action one-time or repeatedly.

- One Time：When the IF Condition is TRUE, this Action will be executed once and only once. This Action will not be executed again until the IF Condition turns to be TRUE again.
- Repeat：When the IF Condition is TRUE, this Action will be executed repeatedly until the IF Condition turns to be FALSE.

vi. All selected Actions will be listed on the Recipe page. Click on the radio checkbox to select the target Action, you can edit the selected Action by click on Edit button, or delete the Action from the list by click on Delete button. To rearrange the order of the Action, click the Move Up or Move Down button to move the target Action to the desired order. To delete all Actions, click on the Clear All button to remove all actions from the list.

vii. Repeat steps ii ~ vi. After all Recipe settings are completed, click “Save” button to save the changes.

## 5.7 Data Logger Setting

WISE-580x offers one set of Data Logger function that allows system to record I/O channel data in Data Log file at a scheduled time or under specific condition. In addition, it also allows to send the Data Log files by FTP or Email. The Data Log file is in CSV format. The following figure illustrates the configuration interface:

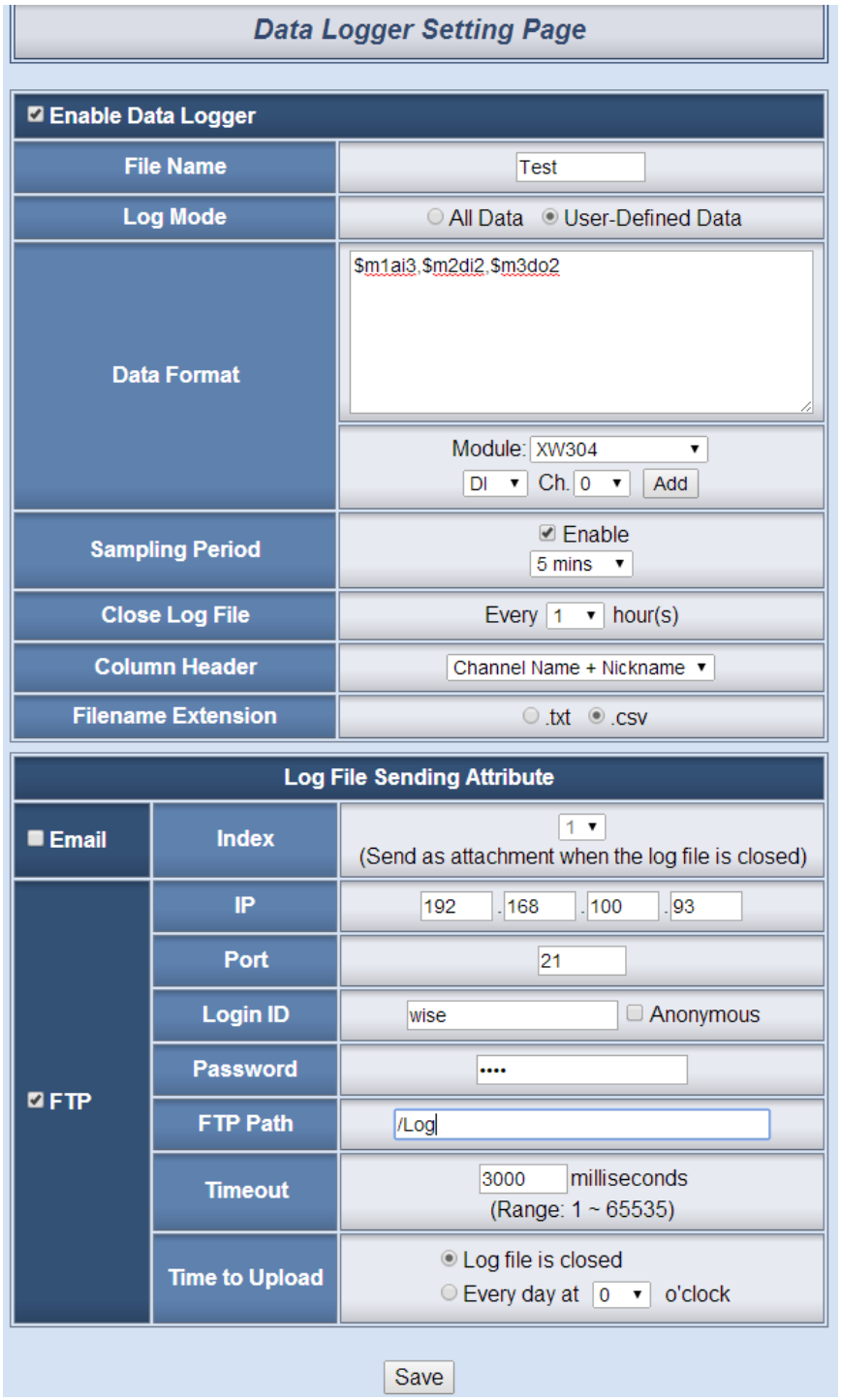



**Figure 5-10：Data Logger setting page**

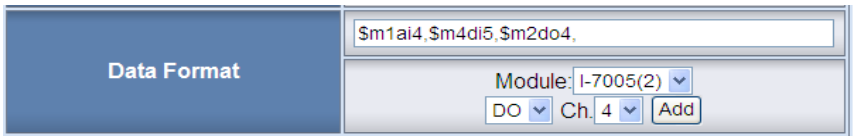
Follow the following steps:

i. Select “Enable Data Logger” to enable the data logger function.

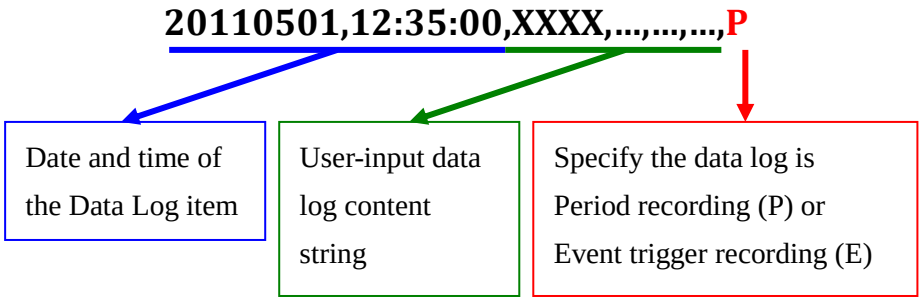
ii. In the “File Name” field, input the data log file name. This name has to be in English; the length is limited to 8 characters.

iii. In the “Log Mode” field, select "All Data" to log all I/O channel and Internal Register data; Or select "User-Defined Data" to edit the log content in the "Data Format" field.

iv. The “Data Format” field allows to edit data format and content. The I/O channel drop down lists help for easy editing data log content format. Following is examples for data log content coding; the following coding indicates: I-7000 module(Address:1) AI4, I-7000 module (Address:4) DI5, I-7000 module(Address:2) DO4. Please note: the content length of the data logger format cannot exceed 4000 characters.




In the data log file, current date, time and data log type (Period recording or Event trigger recording) will also be automatically pasted to each data log item. The final data log content format will be like this:


20110501,12:35:00,XXXX,...,...,...,P
Date and time of the Data Log item
User-input data log content string
Specify the data log is Period recording (P) or Event trigger recording (E)

v. Select “Sampling Period” to enable period recording function in WISE. When the time reaches the period time interval, the data will be recorded once in pre-set data format. The data recording will keep going periodically. There are ten options: 10 secs, 30 secs, 1 min, 2 mins, 3 mins, 5 mins, 10 min, 20 min, 30 min, 1 hour.

vi. In the “Close Log File” field, select the time interval to close a data log file. There are eight options: 1 hour, 2 hours, 3 hours, 4 hours, 6 hours, 8 hours, 12 hours, 24 hours.

For example, if the “Close Log File” time interval is set as 3 hours, and “Sampling Period” is set as 5 mins, it means WISE-580x will

record data every 5 mins. And the log file is created at 0 o'clock, 3 o'clock, 6 o'clock, 9 o'clock, 12 o'clock, 15 o'clock, 18 o'clock, and 21 o'clock. When the system time reached these specified time, the Data Log file will be closed automatically (the time interval of this first file will be shorter than 3 hours) and create a new data log file to record another 3 hours and so on.

vii. In the "Column Header" field, there are three options: "None", "Channel Name + Nickname" and "Nickname Only". The module name, channel address and nickname (if any) of each field will be added to the beginning of the content of the data logger file if the user select "Channel Name + Nickname". Select "Nickname Only" to add the column header with channel nickname only. Select "None" to disable the "Column Header" function.

viii. You can select the extension format of the data logger files to be ".txt" or ".cvs" format in the "Filename Extension" field. This selection will not affect the format of the log file contents. If you select the ".cvs" format, the UTF-8 BOM(Byte Order Mark) will be added at the beginning of the log file.

ix. Click the check box to specify the Log file to be sent by Email or FTP. You can select both ways to send the Log file. If no option is selected, the data file will not be sent.

x. If you select the option to send file by Email, select the Email index you are going to send to when the data file is closed. The Email of this index has to be previously set and the file will be sent as an attachment.

xi. If you select the option to send file by FTP, input the FTP Server IP address, port number, login ID, password, FTP path and Timeout information. There are two options for "Time to Upload", you can choose to upload the file when the time of the Log file reached the "Closed File" time interval via FTP, or upload all files saved at that day at a scheduled time. The upload time can be set from the dropdown list.

xii. After all Data Logger settings are completed, click "Save" button to save the changes.

Please note:

1. The micro SD card will be formatted automatically when it is inserted into WISE-580x at the first time.
2. The data logger files inside the micro SD card will be stored by month.

When the micro SD card's free space is less than 20%, WISE-580x will delete the old log files, and only keeps the data logger files of the last month. Please don't keep any file other than the data logger files in the micro SD card. These files will also be deleted by the system according to this rule.

## 5.8 Active I/O Setting

WISE-580x equips the "Active I/O sending" function. There are two parts in this function: **"I/O Data Table Configuration"** and **"Active sending of I/O Data Table"**. Even though WISE-580x allows to connect with up to 16 I-7000 I/O modules, and 4 Modbus RTU Slave I/O modules at the same time, however, the channel data of each I/O module that WISE-580x received is located in the different Modbus Address memory block of WISE-580x. Therefore, when using SCADA software to retrieve the data, the SCADA software must poll each I/O module's channel data separately. It is impossible to poll all WISE-580x I/O module's channels data at one time. In order to improve the efficient of the data communication between WISE-580x and SCADA software, WISE-580x provides **"I/O Data Table Configuration"** function. It allows to rearrange the I/O channels data from different I/O modules and puts them into a continuous Modbus address memory block, and then SCADA software can retrieve all I/O channels data from different modules by using one single Modbus command. Comparing to traditional polling mechanism, it will greatly save time and polling attempts. In addition to the **"I/O Data Table Configuration"** function, WISE-580x also provide the **"Active sending of I/O Data Table"** function. It allows WISE-580x to actively send the content of **I/O Data Table** to SCADA software through Modbus TCP protocol without polling mechanism from SCADA software.

Please note: The SCADA software must equip the Modbus TCP Slave function to receive the content of I/O Data Table that sent by WISE-580x.

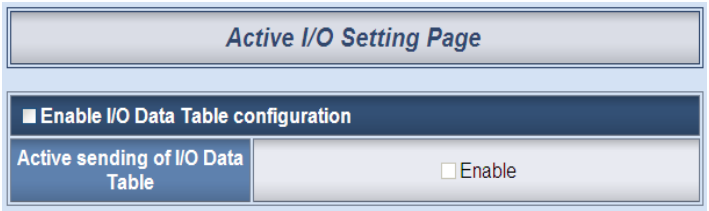



**Figure 5-11：Active I/O Setting page**

Follow the following steps:

i. Select “Enable I/O Data Table configuration” to enable the I/O Data Table function, then the I/O Data Table and the configuration UI will be shown as follow:

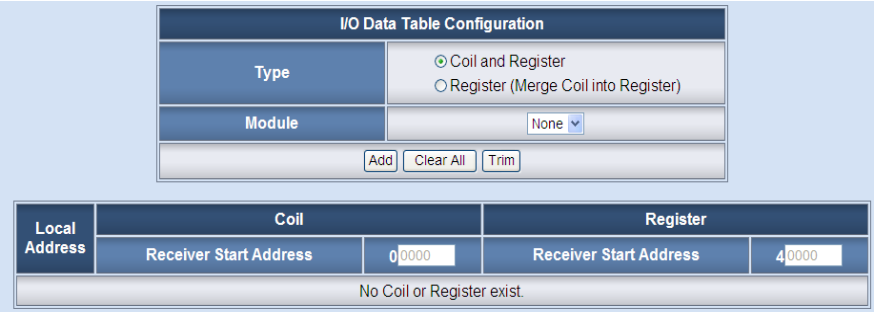



**Figure 5-12：I/O Data Table configuration UI**

ii. There are two data arrangement types for the I/O Data Table: ”Coil and Register” and “Register (Merge Coil into Register)”. In the ”Coil and Register” type, The I/O module’s DI/DO/Modbus Coil data will be saved in the Coil area of the I/O Data Table, and the I/O module’s AI/AO/Modbus Register/Internal Register data will be saved in the Register area of the I/O Data Table. If you select the “Register (Merge Coil into Register)” type, then the I/O module’s DI/DO/Modbus Coil data will be saved in the Register area of the I/O Data Table in binary format. Each Register can store 16 Coils data.

iii. The “Module” field allows to select specific I/O module or Internal Register that will be used in the I/O Data Table; select the “Channel” and “Index” number from the drop down lists to edit the table configuration of the I/O module’s channel.

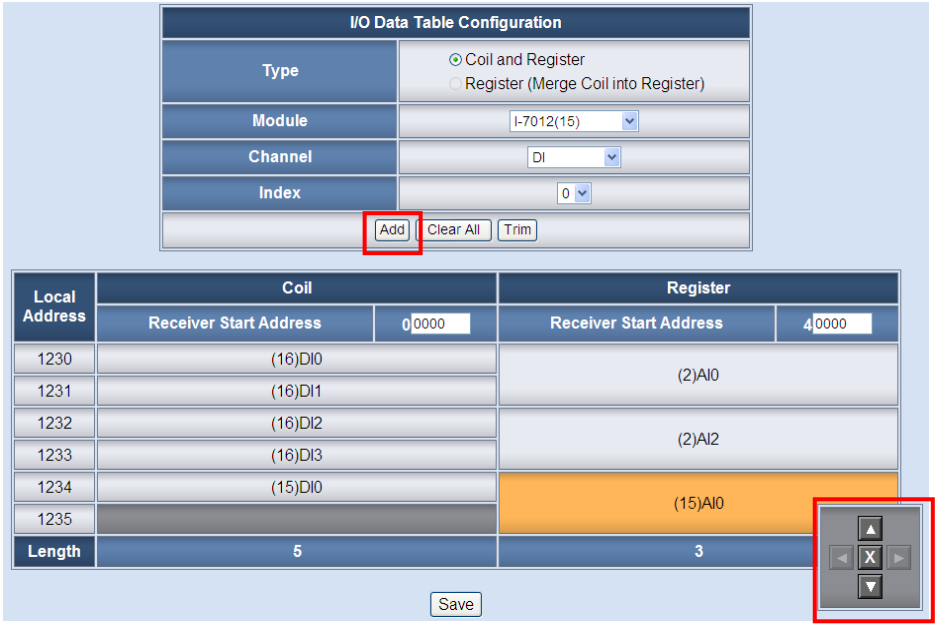



**Figure 5-13：The I/O Data Table for "Coil and Register" type**

When you complete the setting of Module, Channel and Index, please click the "Add" button to add the channel of the I/O module into the I/O Data Table. You can use the Control Panel in the right-bottom of the I/O Data Table to "Move" or "Delete" the channel setting of the I/O Data Table. The "Clear All" button is used to clear all channel settings in the I/O Data Table. "Trim" button is used to remove all the excess space between the channel settings to make all channel settings of the I/O Data Table to be more compact.

In the I/O Data Table, the "Local Address" in the left side is the address for saving I/O Data Table in the WISE Modbus Address Table. The starting address is 1230(Base 0 & Decimal format). The maximum length is 300. Therefore, SCADA software can connect to the WISE Modbus address 01230 to inquire the first Coil data in the I/O Data Table, and connect to the WISE Modbus address 41230 to inquire the first Register data in the I/O Data Table. If the "Active sending of I/O Data Table" function is enabled, the "Receiver Start Address" in the upper area of the I/O Data Table is the address of the Receiver's(SCADA software) Modbus starting address. The content of the I/O Data Table that WISE-580x send actively to Receiver's(SCADA software with Modbus TCP Slave function) will be saved from the starting address. The naming rule

of the channel inside the I/O Data Table is: (RS-485 Address) Channel Type + Channel Index. For example, (1)DI0 is for the DI0 channel of the I/O module with RS-485 address 1

The following figure shows an example of the data arrangement of the I/O Data Table for the "Register (Merge Coil into Register)" type.

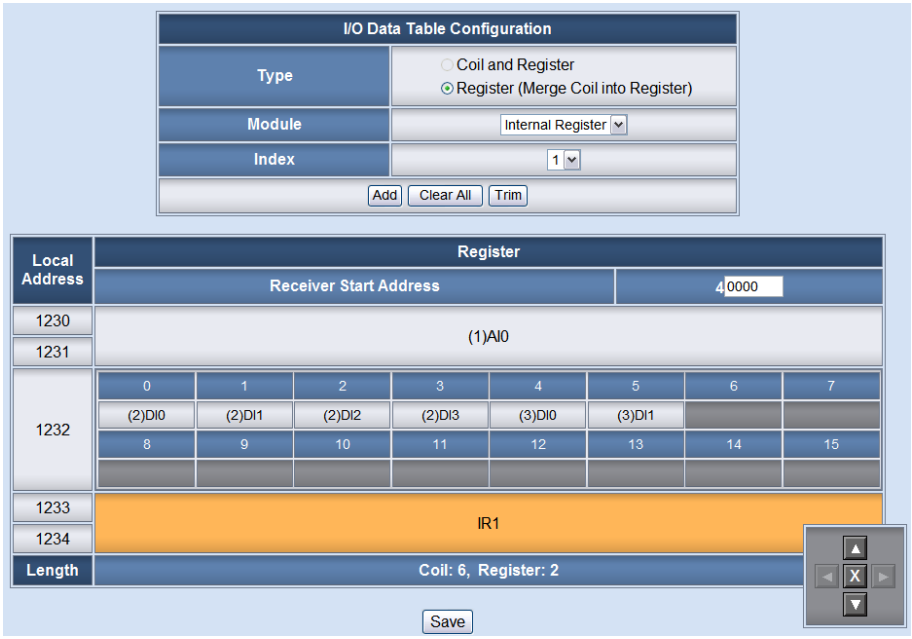



**Figure 5-14：The I/O Data Table for "Register(Merge Coil into Register)" type**

iv. Enable the "Active sending of I/O Data Table", then WISE-580x will actively send all the I/O Data Table's channels data to the SCADA software.

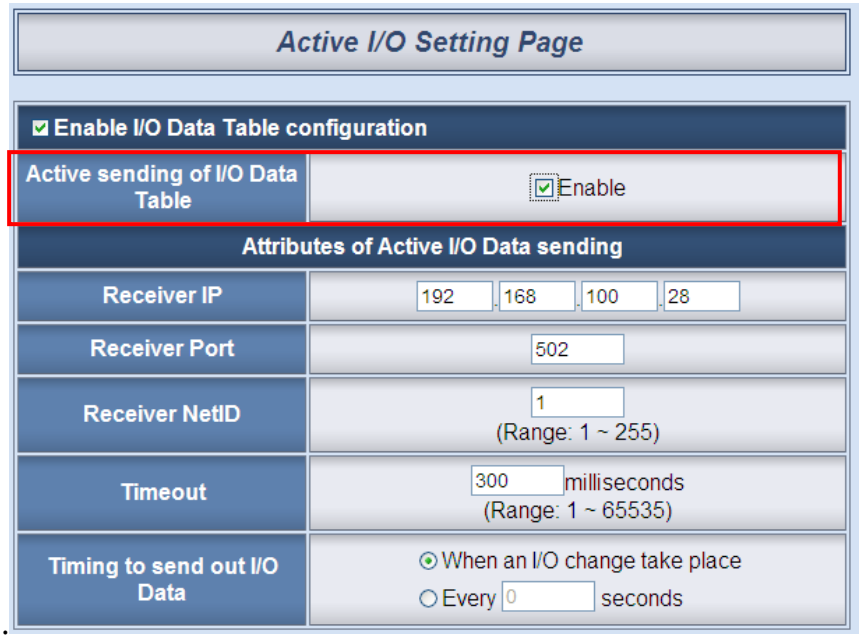



**Figure 5-15：Attribute of "Active I/O Data Sending"**

It is required to set the Receiver's (SCADA software) IP address, the Modbus TCP Slave's Port number and NetID of the Receiver's, the Timeout value, and the type of "Timing to send out I/O Data". There are two options for the "Timing to send out I/O Data", one option is to send out the data when an I/O channel value change takes place, the other is to send out the data at periodic time schedule.

## 5.9 SMS Setting

WISE-5801 offers SMS alarm message sending and SMS command receiving functions. For SMS alarm message sending function; WISE-5801 offers up to 12 SMS alarm settings. It allows to send pre-set SMS alarm to specific phone numbers. For SMS command receiving function; WISE-5801 allows to set up maximum 3 authorized phone numbers to receive SMS commands. WISE-5801 will execute the commands received from authorized phone numbers only. There are three types of SMS commands:

- **Retrieve real-time channel data:** you can retrieve specific channel real-time data, one SMS command message can require up to 10 channel data values. To retrieve the channel data of WISE-5801, follow the following coding rules to send a SMS command to WISE-5801:

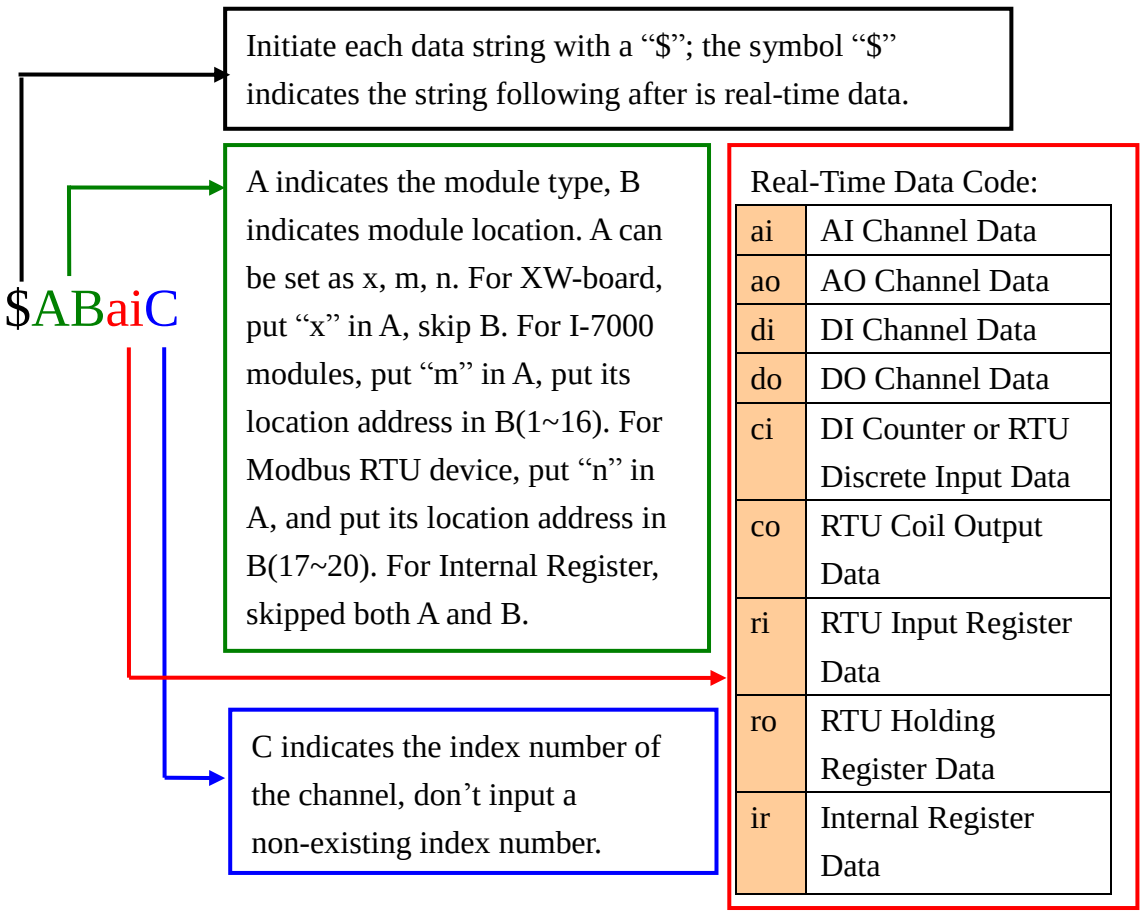

Initiate each data string with a "$"; the symbol "$" indicates the string following after is real-time data.
$ABaiC
A indicates the module type, B indicates module location. A can be set as x, m, n. For XW-board, put "x" in A, skip B. For I-7000 modules, put "m" in A, put its location address in B(1~16). For Modbus RTU device, put "n" in A, and put its location address in B(17~20). For Internal Register, skipped both A and B.
C indicates the index number of the channel, don't input a non-existing index number.
Real-Time Data Code:
ai AI Channel Data
ao AO Channel Data
di DI Channel Data
do DO Channel Data
ci DI Counter or RTU Discrete Input Data
co RTU Coil Output Data
ri RTU Input Register Data
ro RTU Holding Register Data
ir Internal Register Data

**Figure 5-16：SMS Command Data Retrieve Coding Rules**

- **Modify channel data:** WISE-5801 allows to modify output channel and Internal Register data by SMS command. Each SMS command message allows to modify one output channel or Internal Register value. Specify the output channel or Internal Register by the coding rules as described above, add a "/" at the end of the string and then add the data value you would like to change to (For DO: input 0 or 1, 0 indicates OFF and 1 indicates ON. For AO: input the value in floating point format.)

- **Modify SMS command variable data:** WISE-5801 offers up to 12 SMS command variables. The status of the variables can be set as 0 or 1. The status of SMS command variable can be included in IF Condition as part of logic rules. You can send a SMS command message to modify the status of the variable, and then perform the execution of an Action that has been previously set.

**3 types of SMS command examples are given as follow:**

| SMS Command Types | The SMS Command that user sends | The SMS message that WISE-5801 replies |
|---|---|---|
| Retrieve real-time channel data | **GET:$xdi0,$m1ai2,$n18ro3** (Inquires the value of DI0 on XW-Board, the value of AI channel 2 on I-7000 that locates at address 1 and the value of Holding Register address 18 on Modbus RTU device that locates at address 3.) | **GET ON,8.7,4.3** (Replies real-time channel data) |
| Modify channel data | **SET:$m2ao1/2.5** (Modify the value on AO channel 1 on the I-7024 that locates at address 2; the value is modified to be 2.5.) | **SET I-7024(2) AO Channel 1 as 2.5** (Replies that the value on AO channel 1 on the I-7024 has been modified to 2.5) |
| Modify SMS command variable data | **ACT:2/1** (Modify the value of SMS Command variable 2 to be 1.) | **SMS Command 2 set as 1** (Replies that the value of SMS command variable 2 has been modified to 1 ) |

In additional to edit the SMS command by command coding rules, WISE-5801 also provides an user-friendly interface for editing a SMS Quick command – a simple self-defined command string to replace the original complex SMS command(applies to Firmware v2.3 or later version). When WISE-5801 receives the SMS Quick Command, it will automatically translate it to the SMS original command, and execute the SMS command.

The SMS setting page is as follow:

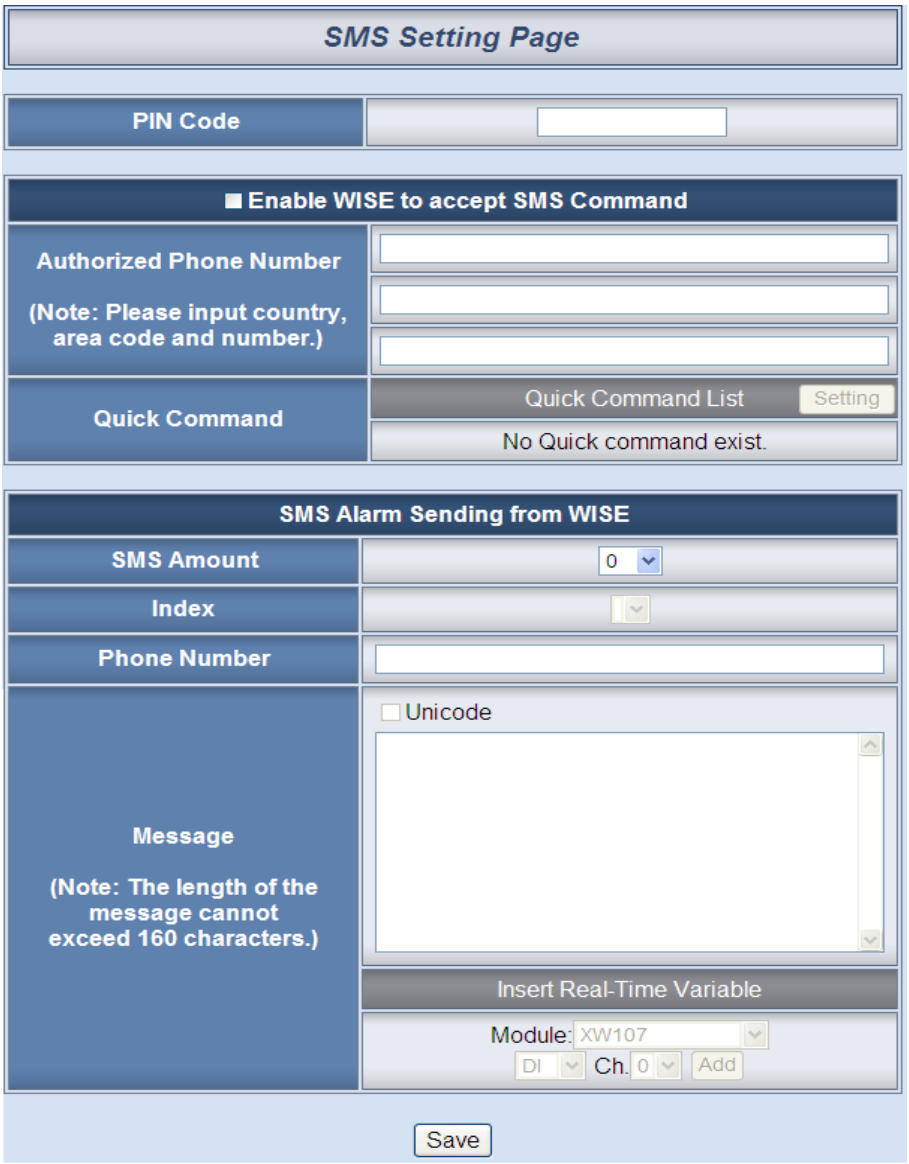



**Figure 5-17：SMS Setting Page**

Please follow the steps below:

i. In the PIN field, input the 4 digit SIM card PIN code. If the PIN code is not required, leave the field blank.

ii. Enable the ”Enable WISE to accept SMS Command” function to start the SMS command receiving function. In the “Authorized Phone Number” field, input the phone numbers you would like to authorize to send SMS commands to WISE-5801. Please note: the Authorized Phone Number has to be input in the format: Country code, area code and number. For example, if the Authorized Phone Number is a cell phone number 0987654321 in Taiwan area, please input the Authorized Phone Number as “886987654321”. If you

don't know the Country code and the area code, you can use a cellular phone to send the SMS command "**ECHO**" to the WISE-5801. When WISE-5801 receives the command, it will reply a SMS message to the cellular phone you use. The SMS message will include the phone number with the Country code and the area code of the SMS message sender that WISE-5801 receives. After getting the information, you can enter the exact phone number of the SMS message sender in the "Authorized Phone Number" field of the WISE-5801.

iii. To use the SMS Quick command edition function, please click the "Setting" button in the Quick Command field, then a "SMS Quick Command Setting" Page will pop up as follow:

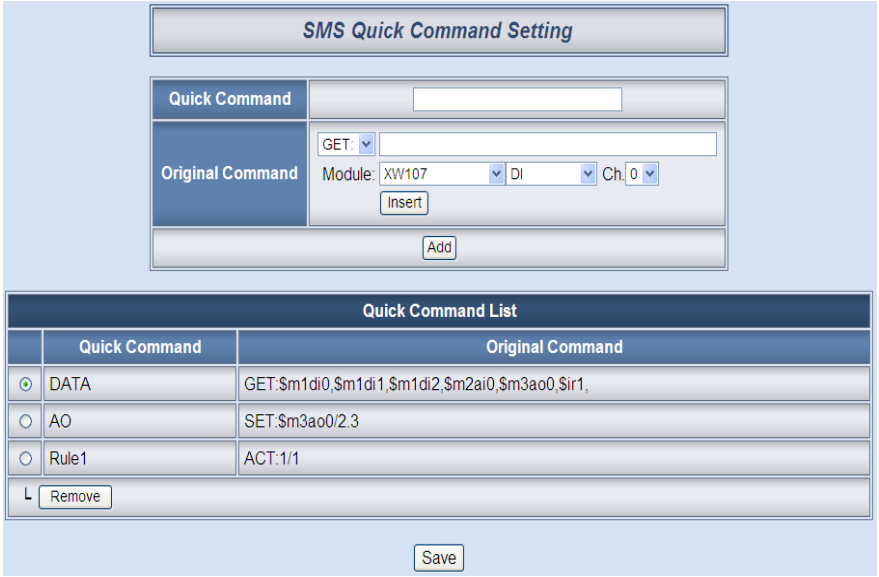



**Figure 5-18：SMS Quick Command Setting Page**

Input a simple, self-defined command string in the "Quick Command" field, and then edit the original SMS command by selecting the command type and I/O channel from the dropdown list (shown as figure above) in the "Original Command" field . Press "Add" button after finishing the SMS command setting; the SMS Quick command and its corresponding SMS Original Command will be shown in the Quick Command List field. Now you can send the SMS Quick command string "DATA" (shown as the Quick Command List in the figure above) to WISE-5801, after WISE-5801 receiving the "DATA" command, it will execute its original command "GET:$m1di0,$m1di1,$m1di2,$m2ai0,$m3ao0, $ir1,' to retrieve the DI0/DI1/DI2 channel values of I/O module

(Address=1), the AI0 channel value of I/O module(Address=2), the AO0 channel value of I/O module(Address=3) and the IR0(Internal Register 0) value, and then will send back all the values to you.

For “SET” and “ACT” SMS Command, there are two options for SMS Quick Command edition. The first option is as the second listed Quick Command on the Quick Command List (shown as figure above). The “AO” quick command replaces the original command ”SET:$m3ao0/2.3”, when WISE-5801 receive the SMS Quick command “AO”, it will set the AO channel 0 of the I/O module(Address= 3) to be 2.3. The second option is to edit the SMS Quick command “AO” to be ”SET:$m3ao0” as the SMS Original command string. In this format, when use the “AO” Quick command, it is required to append a value to the Quick command string, such as: “AO/2.3”. WISE-5801 will set the AO channel 0 of the I/O module(Address=3) to be 2.3. In this way, the output channel value can be modified flexibly as any other values by sending command like: ”AO/5.6”, ”AO/7.8”.

iv. In the “SMS Amount” field, specify the total number of SMS alarm messages you are going to use from the dropdown list.

v. In the “Index” field, specify the SMS index number to be set up from the dropdown list.

vi. In the “Phone Number” field, input the phone numbers to receive the SMS alarm messages. The SMS can be sent to multiple receivers (up to **30**). Separate the phone number by “**,**”.

vii. Enter the content in the “Message” field. If the Unicode mode is adopted, the length of the content cannot exceed 70 characters. If the Unicode mode is not selected (support English characters), the length of the content limit is 160 characters. To quickly add a real-time I/O channel value into the SMS content, use the I/O channel selection interface (shown as figure above) to add the I/O channel value encoded string into the SMS content.

viii. Repeat steps iv~ vi. After all SMS alarm settings are completed, click “Save” button to save the changes.

# 6 Rules Setting

After finishing all Advanced Setting configurations, you can start to edit IF-THEN-ELSE rules. Click the “Rules Setting” button, a Rule Manager table will appear, and the list of rules will be displayed on the left side of the page. At the left side of the page, the status of each rule will be displayed. And at the right side of the page will show detailed content of each rule that was previously defined. The rule setting page is shown as below:

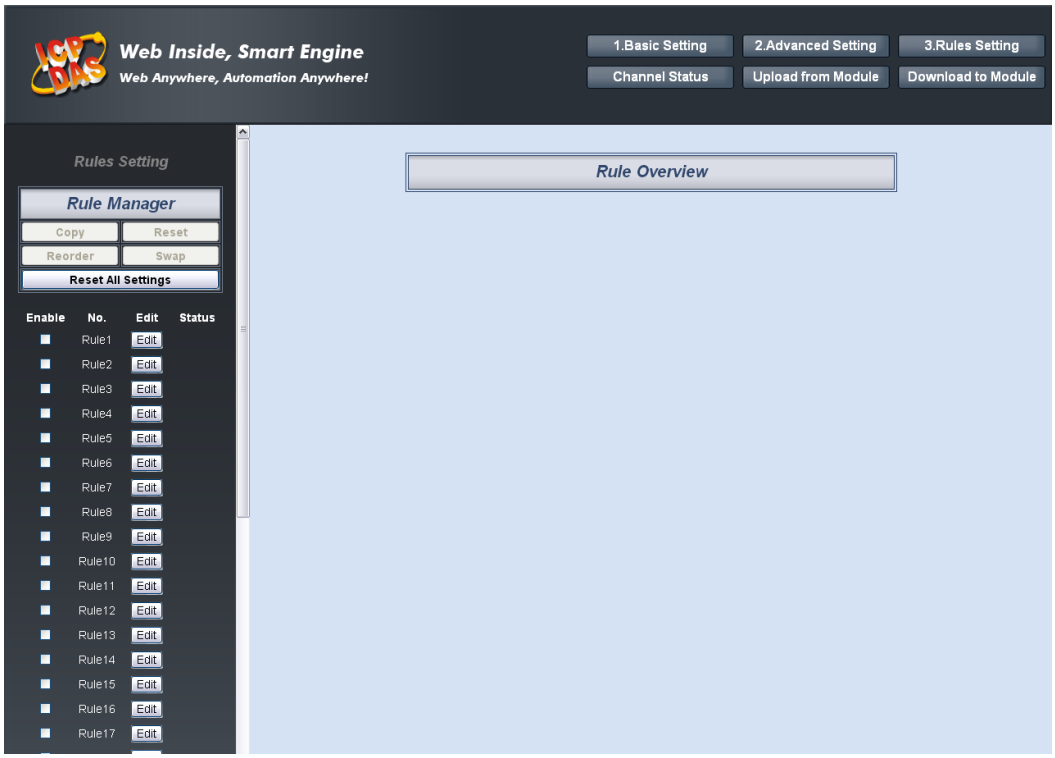



**Figure 6-1：Rules setting page**

On the left side of the page, a Rule Manager table will appear at the top of the page. It provides the “Copy”, “Reset”, “Reorder”, “Swap” and “Reset all Setting” functions. More detailed information for Rule Manager will follow. Under the Rule Manager table, the list of rule contains four items:

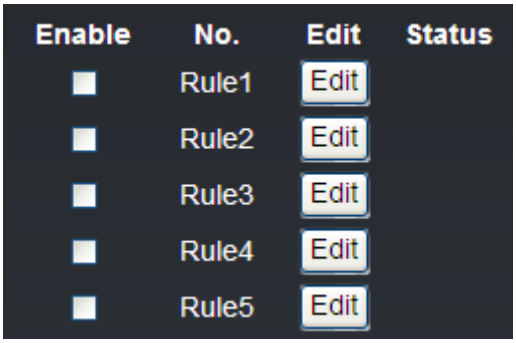



**Figure 6-2：Enable rules, edit rules and status display**

- **Enable**: A checkbox appears before each rule; check the checkbox to enable the rule and this rule will be executed after being downloaded, otherwise it will only be stored temporarily.
- **No.**: Indicates the identification number of the rule. To avoid possible error, it is recommended to assign the identification number in sequence.
- **Edit**: Click the Edit button to edit detail logic content of the rule.
- **Status**: "OK" indicates this rule is successfully defined. "Error" indicates there is error occurs. Please note: if you make modification in IO setting (I-7000 Module, XW-Board or Modbus RTU Slave module) or in Advanced Setting after finish defining the rules, it might cause unexpected error due to the changes, some variables may no longer exist. Therefore, in case you make any modification, please double check your settings and Rules definition to make sure no errors are present.

Click the "Edit" button, the Rules Setting page will appear:

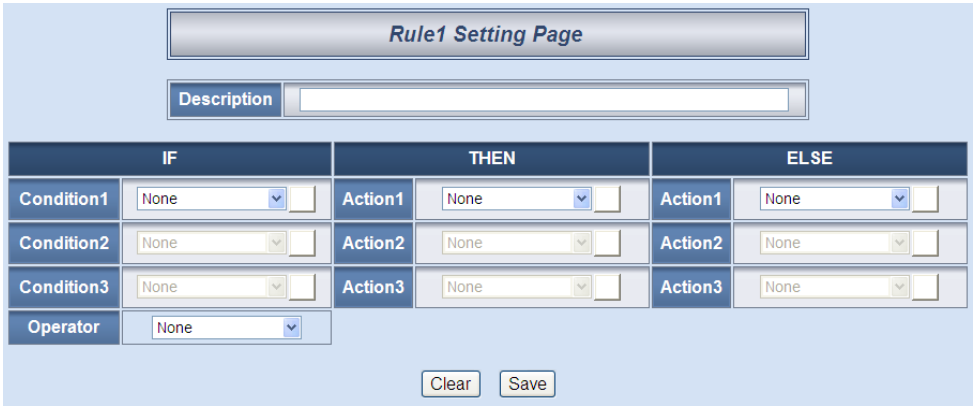



**Figure 6-3：Rule setting page**

The rule number will be displayed at the top of the page. The Description field provides a space for you to make a brief description of this Rule. An IF-THEN-ELSE Rule setting table appears under the description section. Each Rule offer 3 IF conditions. You could create IF(condition) statements by selecting appropriate operator (AND, OR) from the dropdown list. In order to avoid possible errors, the design of this table is foolproof: You are required to finish setting up Condition1 before moving on Condition2, and so on. Each Rule also offers 3 THEN actions, and 3 ELSE actions. More detailed information will follow.

## 6.1 IF Condition

In IF Condition statement, the following values or their status can be included as evaluation criteria:

- AI
- DI
- DI Counter
- Discrete Input
- Coil Output
- Input Register
- Holding Register
- Internal Register
- Timer
- Schedule
- Rule Status
- SMS Command (Apply to WISE-5801 only)
- Connection Status

The AI channels, DI channels, Discrete Input, Coil Output, Input Register and Holding Register on WISE-580x will automatically appear on the list. To include subjects other than I/O channels in the IF Condition statement; they have to be pre-defined in Advanced Setting first. The subjects that already being defined in Advanced Setting will appear on the dropdown list of IF Condition. Select the subject you want to use, and then click right side button, a window will pop up for you to edit detailed information.

### 6.1.1 AI

AI channel value from XW-Board or I-7000 module can be included in the IF condition statements; the editing page for AI Condition Setting is shown as below:

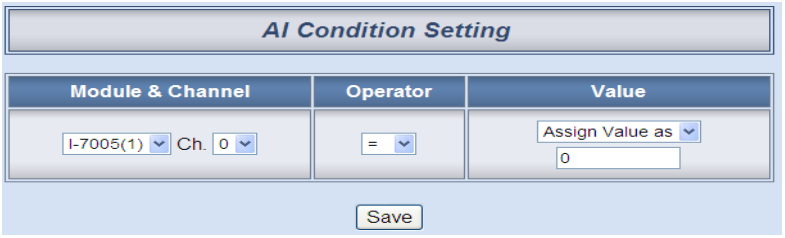
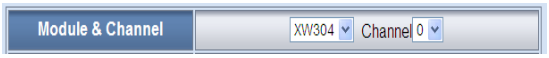


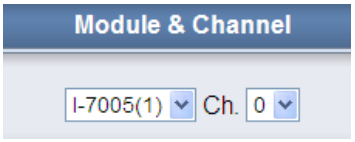

**Figure 6-4：AI condition setting page**

Follow the following steps:

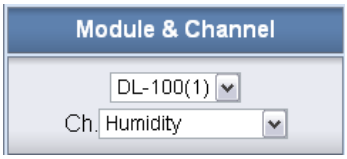
i. Specify the module and channel from the dropdown list of the "Module & Channel" section that you are going to include its value in the IF condition statements.
The "Module & Channel" section of XW-Board is shown as below (use XW304 AI channel 0 as an example):




The "Module & Channel" section of I-7000 is shown as below; use I-7005 (Address 1) AI channel 0 as an example:



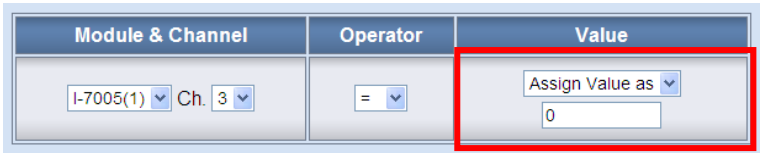

The "Module & Channel" section of DL-100T485 is shown as below; select a channel from "Humidity", "Temperature(℃)" and "Temperature(℉)":




ii. Set up the expression statement for this channel value. Select an operator from "=",">","<",">=" or "<=".

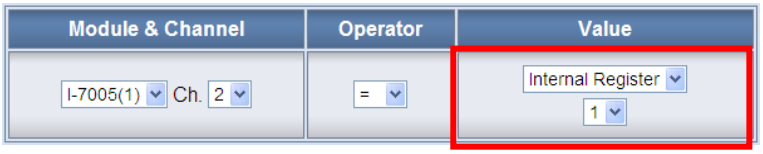
iii. And then specify the evaluation value. If this AI channel value match the evaluation criteria, the result of this condition evaluation will be "true".
You can compare the AI channel value with the following 3 values for condition evaluation:

- Self-Defined value：Giving a self-defined value to compare with the AI channel value.




- Channel value ： Using AI channel values from other modules(XW-Board or I-7000) to compare with the AI channel value.

- Internal Register：Using the internal register value to compare with the AI channel value.




iv. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

### 6.1.2 DI

DI channel value from XW-Board or I-7000 module can be used as evaluation criteria for IF condition statement; the editing page for DI Condition Setting is shown as below:

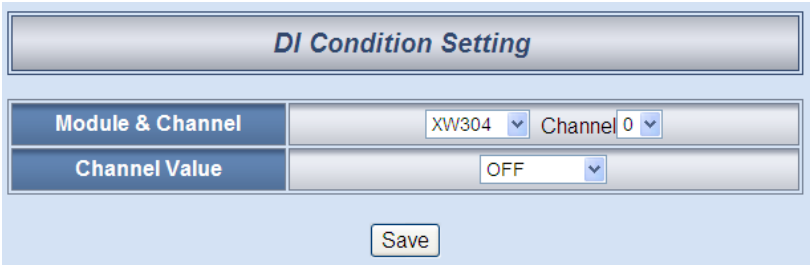



**Figure 6-5：DI condition setting page**

Follow the following steps:

i. Specify the module and channel from the dropdown list of the “Module & Channel” section that you are going to include its value in the IF condition statements.

ii. Define the evaluation criteria of the status in IF statement to be “OFF”, “ON”, “ON to OFF”, “OFF to ON” or “Change”. Once the DI channel value matches the evaluation criteria, the result of this condition evaluation will be “true”. Please note: If the statement involves state transitions: “ON to OFF”, “OFF to ON” and “Change”, the action will be executed only once and only at the moment when the state transition occurs.

iii. Click “Save” button to save the settings. This popup window will be closed and return to the Rule settings page.

### 6.1.3 DI Counter

DI counter value from XW-Board or I-7000 module can be used as evaluation criteria for IF condition statement; the editing page for DI Counter Condition Setting is shown as follow:

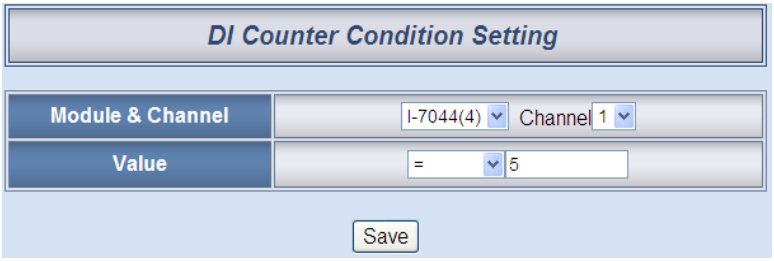



**Figure 6-6：DI Counter condition setting page**

Follow the following steps:

i. Specify the module and channel from the dropdown list of the “Module & Channel” section that you are going to include its value in the IF condition statements.

ii. Set up the expression statement for this counter value. Select an operator from “=”,”>”,”<”,”>=”,“<=” or “Change”. If the operator is “=”,”>”,”<”,”>=” or “<=”, an evaluation value has to be specified; if the DI counter value match the evaluation criteria, the result of this condition evaluation will be “true”. If the operator is “Change”, the condition will be “true” when there is a change to the counter value. The action will be executed only once and only at the moment when DI Counter experience a change.

iii. Click “Save” button to save the settings. This popup window will be closed and return to the Rule settings page.

### 6.1.4 Discrete Input

Discrete Input value from Modbus RTU/TCP module can be used as evaluation criteria for IF condition statement; the editing page for Discrete Input Condition Setting is shown as below:

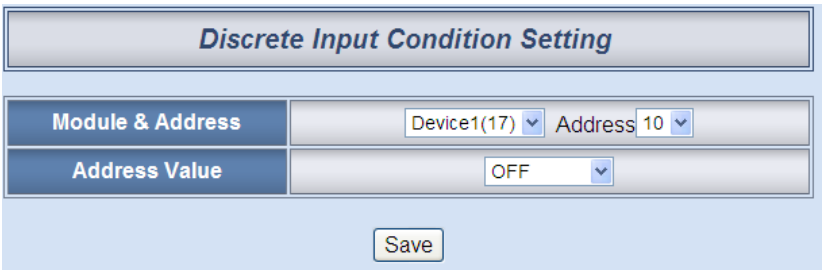



**Figure 6-7：Discrete Input condition setting page**

Follow the following steps:

i. Specify the module and address from the dropdown list of the "Module & Address" section that you are going to include its value in the IF condition statements.
ii. Define the evaluation criteria of the status in IF statement to be "OFF" or "ON". Once the Discrete Input value matches the evaluation criteria, the result of this condition evaluation will be "true".
iii. Click "Save" button to save the settings. This popup window will be closed and return to the Rule settings page.

### 6.1.5 Coil Output

Coil Output value from Modbus RTU/TCP module can be used as evaluation criteria for IF condition statement; the editing page for Coil Output Condition Setting is shown as below:

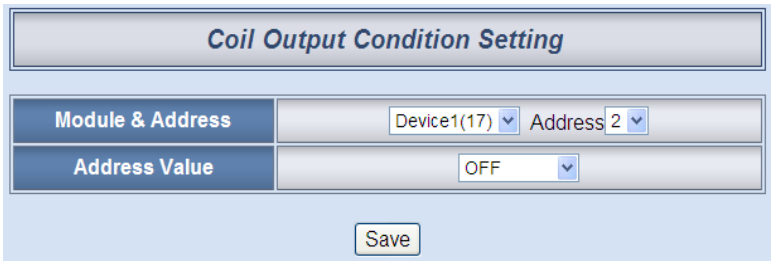



**Figure 6-8：Coil Output condition setting page**

Follow the following steps:

i. Specify the module and address from the dropdown list of the "Module & Address" section that you are going to include its value in the IF condition statements.
ii. Define the evaluation criteria of the status in IF statement to be "OFF" or "ON". Once the Coil Output value matches the

evaluation criteria, the result of this condition evaluation will be "true".

iii. Click "Save" button to save the settings. This popup window will be closed and return to the Rule settings page.

### 6.1.6 Input Register

Input Register value from Modbus RTU/TCP module can be included in the IF condition statements; the editing page for Input Register Condition Setting is shown as below:

**Figure 6-9：Input Register condition setting page**

Follow the following steps:

i. Specify the module and address from the dropdown list of the "Module & Address" section that you are going to include its value in the IF condition statements.

ii. Set up the expression statement for this channel value. Select an operator from "=",">","<",">=" or "<=".

iii. And then specify the evaluation value. If this Input Register value match the evaluation criteria, the result of this condition evaluation will be "true".

You can compare the Internal Register value with the following 4 values for condition evaluation:

- Self-Defined value：Giving a self-defined value to compare with the Internal Register value.

- Input Register: using Input Register value from Modbus RTU/TCP device.

- Holding Register: using Holding Register value from Modbus RTU/TCP device.

- Internal Register：Using another number of internal register value to compare with the Internal Register value.

iv. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

### 6.1.7 Holding Register

Holding Register value from Modbus RTU/TCP module can be included in the IF condition statements; the editing page for Holding Register Condition Setting is shown as below:

**Figure 6-10：Holding Register condition setting page**

Follow the following steps:

i. Specify the module and address from the dropdown list of the “Module & Address” section that you are going to include its value in the IF condition statements.

ii. Set up the expression statement for this channel value. Select an

operator from “=”,”>”,”<”,”>=” or “<=”.

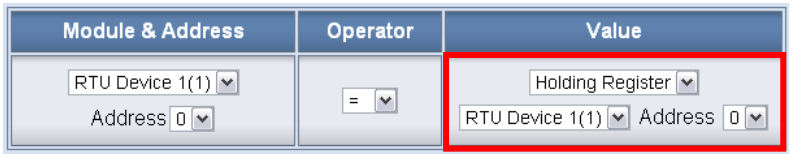
iii. And then specify the evaluation value. If this Holding Register value match the evaluation criteria, the result of this condition evaluation will be “true”.

You can compare the Internal Register value with the following 4 values for condition evaluation:

- Self-Defined value：Giving a self-defined value to compare with the Internal Register value.

- Input Register: using Input Register value from Modbus RTU/TCP device.

- Holding Register: using Holding Register value from Modbus RTU/TCP device.




- Internal Register：Using another number of internal register value to compare with the Internal Register value.

iv. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

### 6.1.8 Internal Register

Internal Register value can be used as evaluation criteria for IF condition statement; the editing page for Internal Register Condition

Setting is shown as follow:

**Figure 6-11：Internal register condition setting page**

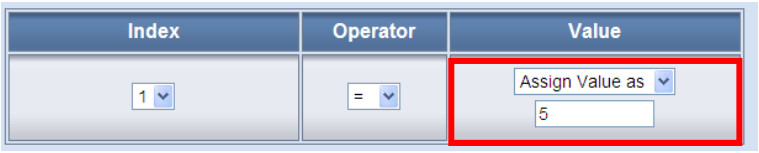
Follow the following steps:

i. Select the Internal Register that you are going to use the value as evaluation criteria for IF condition statement. Specify the Internal Register Index from the dropdown list of “Index” field.

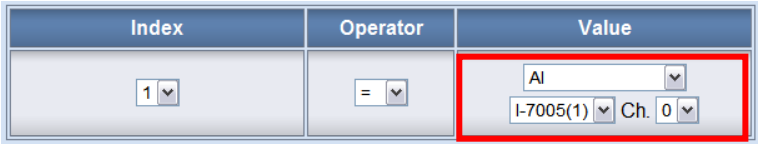
ii. Set up the expression statement for this Internal Register value. Select an operator from “=”,”>”,”<”,”>=” or “<=”, and then specify the evaluation value. If this Internal Register value match the evaluation criteria, the result of this condition evaluation will be “true”.

You can compare the Internal Register value with the following 5 values for condition evaluation:

- Self-Defined value：Giving a self-defined value to compare with the Internal Register value.



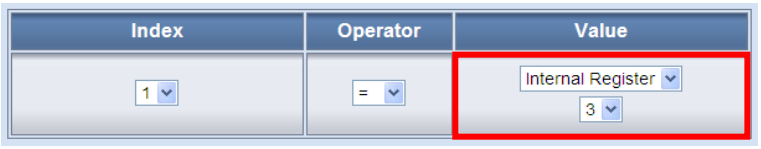

- Channel value：Using AI channel values from other modules (XW-Board or I-7000) to compare with the Internal Register value.




- Input Register: using Input Register value from Modbus RTU/TCP device.

- Holding Register: using Holding Register value from Modbus RTU/TCP device.

- Internal Register：Using another number of internal register value to compare with the Internal Register value.




iii. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

### 6.1.9 Timer

Timer condition can be used as evaluation criteria for IF condition statement; the editing page for timer condition setting is shown as follow:

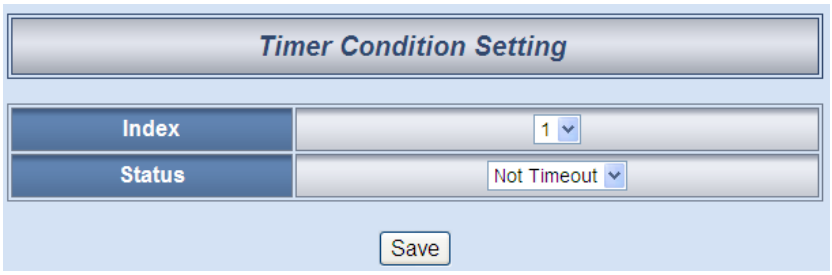



**Figure 6-12：Timer condition setting page**

Follow the following steps:

i. Select the timer that you are going to use its status as evaluation criteria for IF condition statement. Specify the timer index from the dropdown list of the “Index” field.

ii. Define the evaluation criteria of the timer status in IF statement to be “Not timeout” or “Timeout”. If the timer status match the evaluation criteria, the result of this condition evaluation will be “true”.

iii. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

### 6.1.10 Schedule

Schedule condition can be used as evaluation criteria for IF condition statement; the editing page for Schedule condition Setting is shown as follow:

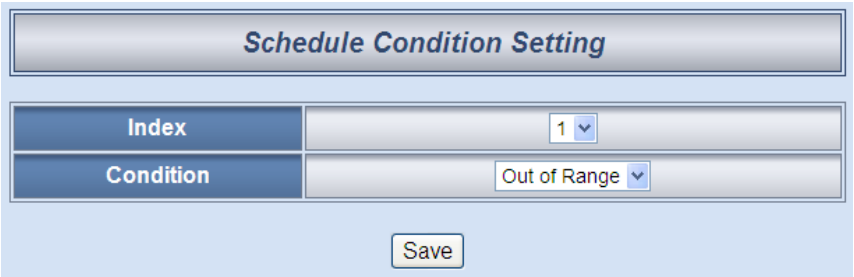



**Figure 6-13：Schedule condition setting page**

Follow the following steps:

i. Select the schedule that you are going to use its status as evaluation criteria for IF condition statement. Specify the schedule index from the dropdown list of the “Index” field.

ii. Define the evaluation criteria of the status in IF statement to be “Out of Range” or “In Range”. If the status of the schedule matches the evaluation criteria, the result of this condition evaluation will be “true”.

iii. Click “Save” button to save the settings. The popup window will closed and return to the rule settings page.

### 6.1.11 Rule Status

The Rule Status (if the Rule is disabled or enabled) can be used as evaluation criteria for IF condition statement. Please note: there must be at least one edited rule on WISE controller for setting up Rule Status in the IF Condition Setting page. The editing page for Rule Status Condition Setting is shown as below:

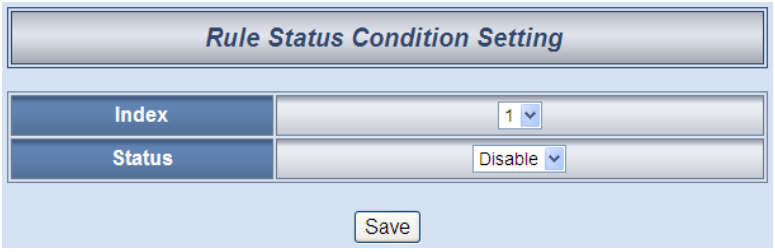



**Figure 6-14：Rule Status condition setting page**

Follow the following steps:

i. Specify the index number of the Rule that is going to be used in the IF Condition statement from the dropdown list of the “Index” field.

ii. Specify the Rule status to be Disable or Enable from the dropdown list of the “Status” field. When the Rule status matches the specified status, the evaluation result will be “true”.

iii. Click “Save” button to save the settings. The Rule Status Condition Setting page will be closed and return to the Rule setting page.

### 6.1.12 SMS Command

The SMS Command variable status can included in IF Condition as part of logic rules. It allows to modify the SMS Command variable status for remote control. The setting page is shown as below:

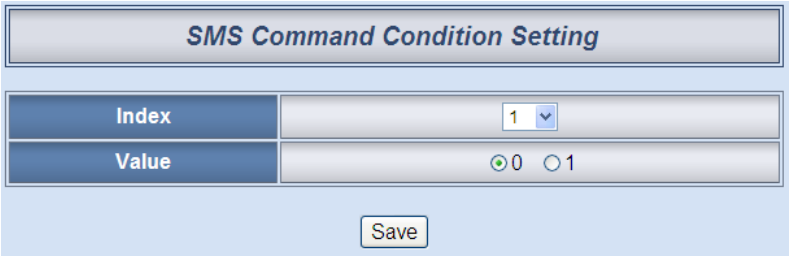



**Figure 6-15：SMS Command setting page**

Please follow the steps below:

i. In the “Index” field, specify the SMS command variable index number you want to use in IF condition from the dropdown list.

ii. In the “Value” field, set the SMS command variable status to be “0” or “1”. Once when the variable matches this pre-set status value, the evaluation result will be TRUE. The default pre-set status value is “0”. Click “Save” button to save the settings. The popup window will be closed and will return to the rule setting page.

### 6.1.13 Connection Status

The Connection Status of remote I/O modules connected via RS-485 line can be used as evaluation criteria for IF condition statement. The

editing page for Rule Status Condition Setting is shown as below:

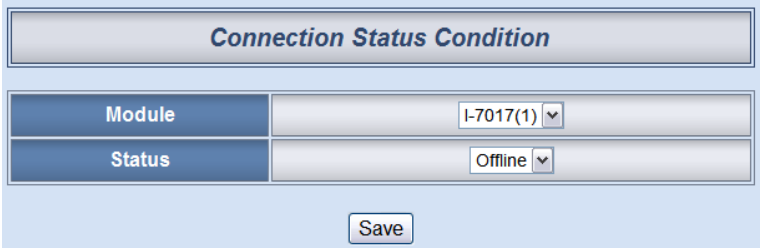



**Figure 6-16：Connection Status condition setting page**

Follow the following steps:

i. Specify the remote I/O module that is going to be used in the IF Condition statement from the dropdown list of the “Module” field.

ii. Specify the Connection status to be Offline or Online from the dropdown list of the “Status” field. When the connection status of the remote I/O module matches the specified status, the evaluation result will be “true”.

iii. Click “Save” button to save the settings. The Connection Status Condition Setting page will be closed and return to the Rule setting page.

## 6.2 THEN/ELSE Action

In the THEN/ELSE Action statement, the following values or status can be included:

- AO
- DO
- DI Counter
- Coil Output
- Holding Register
- Internal Register
- Timer
- Schedule
- Email
- CGI
- Recipe
- Rule Status
- Data Logger
- SMS Alarm( Apply to WISE-5801 only )

The AO channels, DO channels, Coil Output and Holding Register on WISE-580x will automatically appear on the list. To include subjects other than I/O channels in the THEN/ELSE Action statement; they have to be pre-defined in Advanced Setting first. The subjects that already being defined in Advanced Setting will appear on the dropdown list of THEN/ELSE Action. Select the component for Action statement from the combo box, and then click the right side button, a window will pop up for you to edit detailed information. The THEN Action statement will be executed only when the result of IF condition statement is found “true”; otherwise the ELSE Action statement will be executed. In order to meet application requirement, for some Actions, WISE offers options to execute the Action one-time or repeatedly.

- One Time: when the IF Condition is TRUE, this Action will be executed once and only once. This Action will not be executed again until the IF Condition turns to be TRUE again.
- Repeat: when the IF Condition is TRUE, this Action will be executed repeatedly until the IF Condition turns to be FALSE.

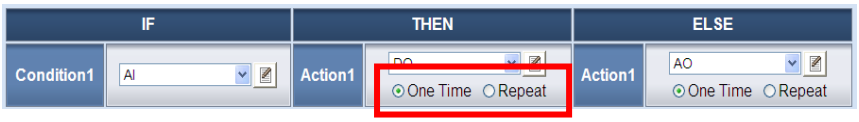



**Figure 6-17：”One-Time Action” & ”Repeat Action” Items**

### 6.2.1 AO

You can execute an action in AO channel of XW-Board or I-7000 module in THEN/ELSE Action statement; the editing page for AO Action is shown as follow:

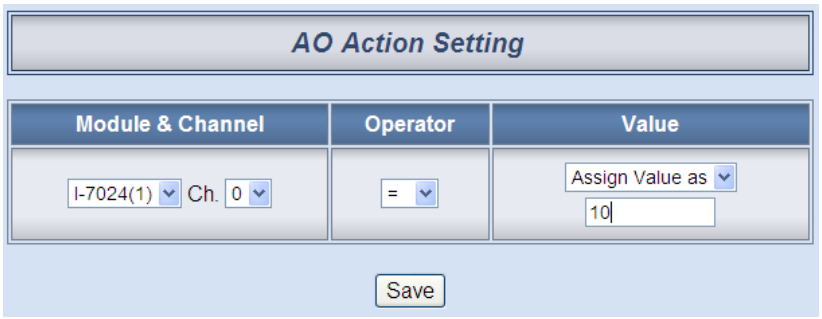



**Figure 6-18：AO action setting page**

Follow the following steps:

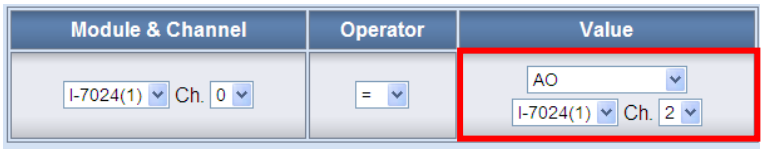
i. From the dropdown list of the “Module & Channel” field, select the AO channel index to execute actions.

ii. Specify the Operator in the “Operator” field. The 3 operators are as follow：
   - “=”：Indicate assign the new AO channel value as the value in “Value” field
   - “+=”：Indicate assign the new AO channel value as the original AO channel value plus the value in “Value” field.
   - “－=”：Indicate assign the new AO channel value as the original AO channel value minus the value in “Value” field.

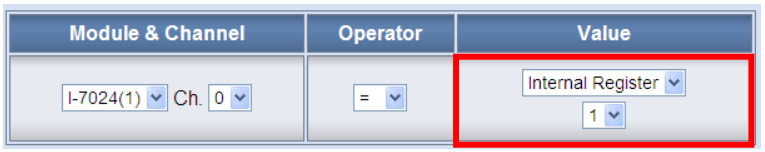
iii. In the “Value” field, 4 sources can be used as channel value :
   - Self-Defined Value: assign a self-defined value

   - AI Channel value: using AI channel values from XW-Board or I-7000

- AO Channel value: using AO channel values from XW-Board or I-7000




- Internal Register: using value of Internal Register




iv. Click “Save” button to save the settings. The popup window will be closed and will return to the rule setting page.

### 6.2.2 DO

You can execute an action in DO channel of XW-Board or I-7000 module in the THEN/ELSE Action statement; the editing page for DO Action is shown as follow:

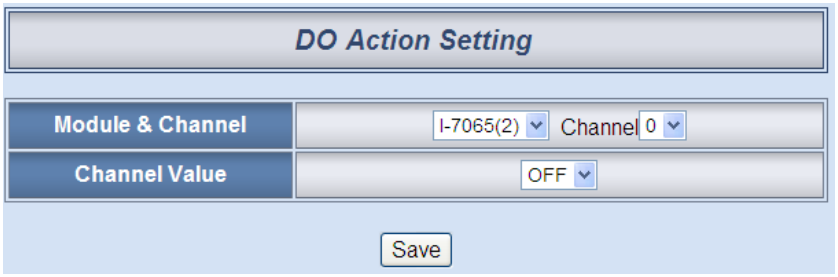



**Figure 6-19：DO action setting page**

Follow the following steps:

i. Select the DO channel from the dropdown list of channel field in the “Module & Channel” section.

ii. Specify the output value of DO Channel from the dropdown list of the “Channel Value” field. The output value can be “OFF”, “ON” or “Pulse Output” (Pulse Output applies to XW-Board only). For I-7088 belongs to PWM (Pulse width modulation) modules, the DO channel Action will be “Start PWM” or “Stop PWM”.

iii. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

### 6.2.3 DI Counter

You can reset DI counter in the THEN/ELSE Action statement; the editing page for DI counter Action is shown as follow:

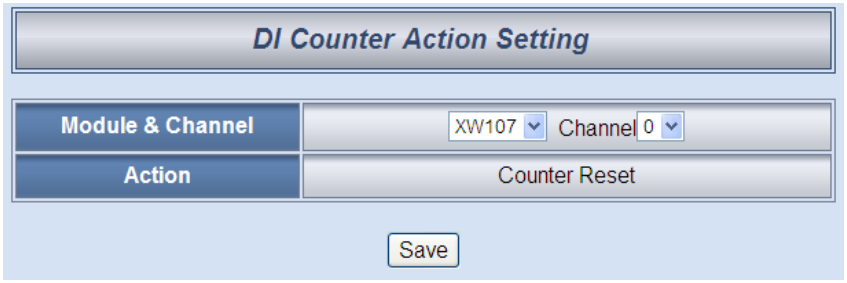



**Figure 6-20：DI Counter action setting page**

Follow the following steps:

i. Select the DI channel to reset DI counter from the dropdown list of channel field in the "Module & Channel" section.
ii. Click "Save" button to save the settings. The popup window will be closed and return to the Rule settings page.

### 6.2.4 Coil Output

You can execute an action in Coil Output channel of Modbus RTU/TCP module in the THEN/ELSE Action statement; the editing page for Coil Output Action is shown as follow:

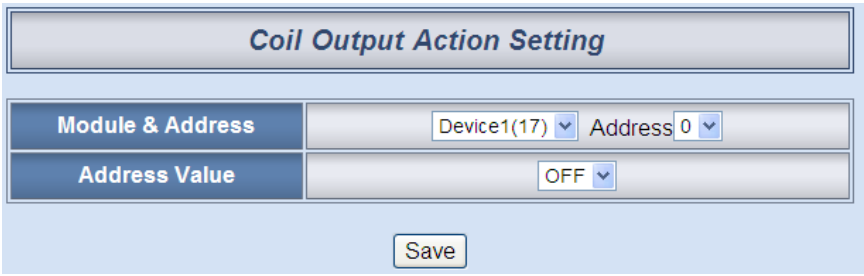



**Figure 6-21：Coil Output action setting page**

Follow the following steps:

i. Select the Coil Output from the dropdown list of channel field in the "Module & Address" section.
ii. Specify the output value of Coil Output from the dropdown list of the "Address Value" field. The output value can be "OFF" or, "ON".
iii. Click "Save" button to save the settings. The popup window will be closed and return to the Rule settings page.

### 6.2.5 Holding Register

You can execute an action in Holding Register channel of Modbus RTU/TCP module in THEN/ELSE Action statement; the editing page for Holding Register Action is shown as follow:

**Figure 6-22：Holding Register action setting page**

Follow the following steps:

i. From the dropdown list of the "Module & Address" field, select the Holding Register address index to execute actions.

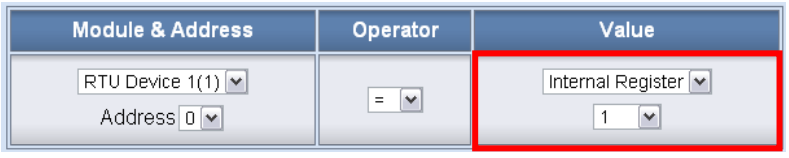
ii. Specify the Operator in the "Operator" field. The 3 operators are as follow：

- "=" ：Indicate assign the new Holding Register address value as the value in "Value" field
- "+=" ：Indicate assign the new Holding Register address value as the original Holding Register address value plus the value in "Value" field.
- "－=" : Indicate assign the new Holding Register address value as the original Holding Register address value minus the value in "Value" field.

iii. In the "Value" field, 4 sources can be used as value:

- Self-Defined Value: assign a self-defined value.

- Internal Register: using value of Internal Register.




- Input Register: using Input Register value from Modbus

RTU/TCP device.

- Holding Register: using Holding Register value from Modbus RTU/TCP device.

iv. Click "Save" button to save the settings. The popup window will be closed and will return to the rule setting page.

### 6.2.6 Internal Register

You can modify the value of Internal Register in the THEN/ELSE Action statement; the editing page for Internal Register Action Setting is shown as below:

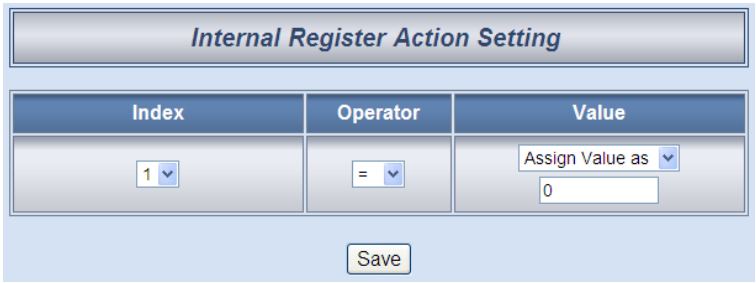



**Figure 6-23：Internal Register action setting page**

Follow the following steps:

i. Select the pre-defined Internal Register from the dropdown list of the "Index" field. Please note: the Internal Register you select has to be enabled in Advanced Setting.

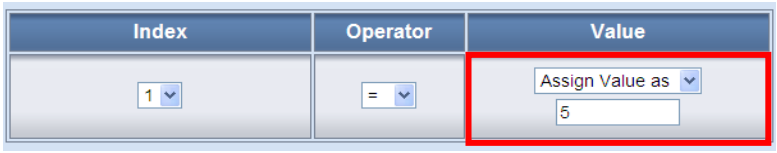
ii. Specify the Operator in the "Operator" field. The 7 operators are as follow:

- "=" : Indicate assign the new Internal Register value as the value in "Value" field.
- "+=" : Indicate assign the new Internal Register value as the original Internal Register value plus the value in "Value" field.

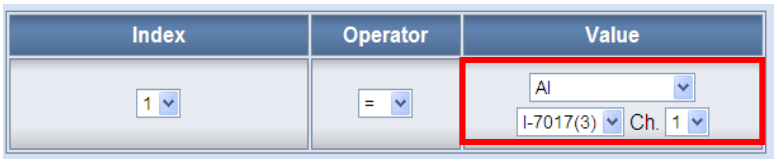
- “－=”：Indicate assign the new Internal Register value as the original Internal Register value minus the value in “Value” field.
- “*=”：Indicate assign the new Internal Register value as the original Internal Register value multiply the value in “Value” field.
- “/=”：Indicate assign the new Internal Register value as the original Internal Register value divide the value in “Value” field.
- “%=”：Indicate assign the new Internal Register value as the original Internal Register value divide the value in “Value” field and return the remainder.
- “&=”：Indicate assign the new Internal Register value as the original Internal Register value(must be 16-bit integer) AND with the value in “Value” field.

iii. In the “Value” field, 6 sources can be used as value :

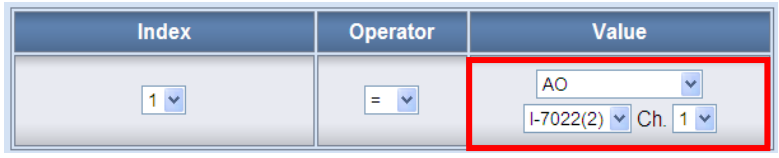
- Self-Defined Value: assign a self-defined value.



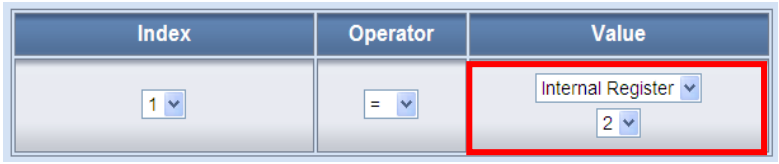

- AI Channel value: using AI channel values from XW-Board or I-7000.




- AO Channel value: using AO channel values from XW-Board or I-7000.




- Internal Register: using value of Internal Register.



- Input Register: using Input Register value from Modbus RTU/TCP device.

- Holding Register: using Holding Register value from Modbus RTU/TCP device.

iv. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

### 6.2.7 Timer

You can change the Timer status (to Start or to Reset the Timer) in the THEN/ELSE Action statement; the editing page for Timer Action Setting is shown as below:

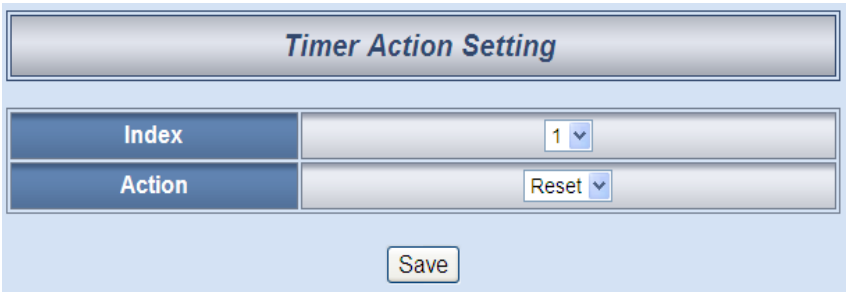



**Figure 6-24：Timer action setting page**

Follow the following steps:

i. Select the pre-defined Timer from the dropdown list of the “Index” field. Please note: the Timer you select has to be enabled in Advanced Setting.

ii. Specify you want to “Reset” or “Start” this Timer when this THEN/ELSE Action statement is executed.

iii. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

### 6.2.8 Schedule

You can change the Schedule status (to Enable or to Disable the Schedule) in the THEN/ELSE Action statement; the editing page for Schedule Action Setting is shown as below:

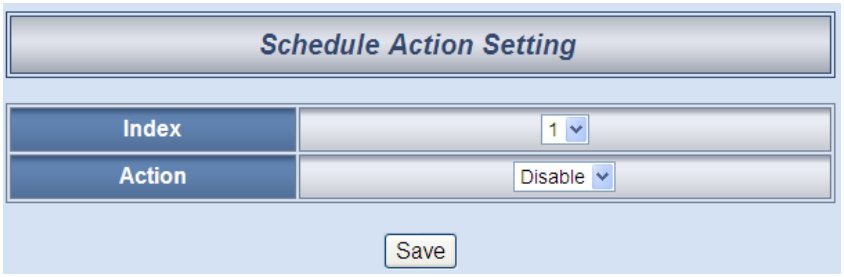



**Figure 6-25：Schedule action setting page**

Follow the following steps:

i. Select the pre-defined Schedule from the dropdown list of the "Index" field. Please note: the Schedule you select has to be enabled in Advanced Setting.
ii. Specify you want to "Enable" or "Disable" this schedule when this THEN/ELSE Action statement is executed.
iii. Click "Save" button to save the settings. The popup window will be closed and return to the Rule settings page.

### 6.2.9 Email

You can send a message to an Email group when executing a THEN/ELSE Action statement; the editing page is as below:

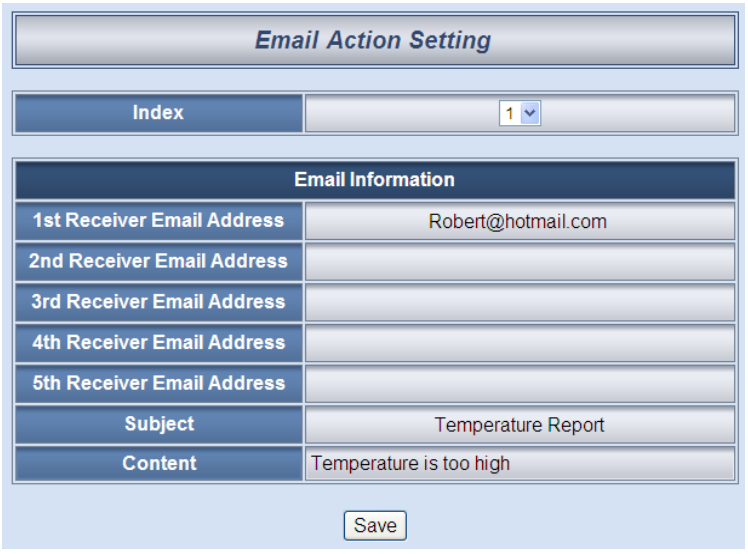



**Figure 6-26：Email action setting page**

Follow the following steps:

i. Select the pre-set Email group from the dropdown list of the "Index" field. Please note: the Email you select has to be enabled in Advanced Setting. The Email group information will be displayed for you to verify if this is the Email group you are going to send the message to.

ii. Click "Save" button to save the settings. The popup window will be closed and return to the Rule settings page.

### 6.2.10 CGI

You can send a CGI Command to a Remote Server device when executing a THEN/ELSE Action statement; the editing page is shown as below:

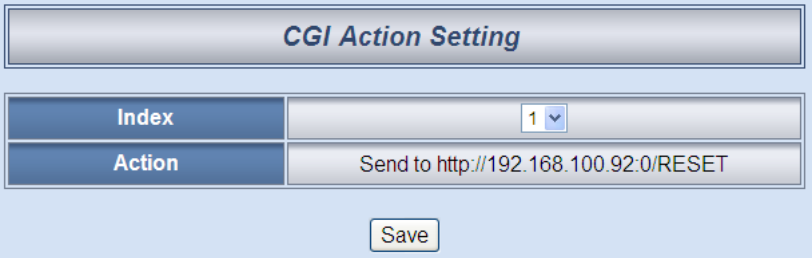



**Figure 6-27：CGI Command action setting page**

Follow the following steps:

i. Select the pre-set CGI Command action from the dropdown list of the "Index" field. Please note: the CGI Command Index you select has to be enabled in Advanced Setting.

ii. Click "Save" button to save the settings. The popup window will be closed and return to the Rule settings page.

### 6.2.11 Recipe

You can execute a Recipe action in THEN/ELSE Action statement; the editing page for Recipe Action is shown as follow:

**Figure 6-28：Recipe action setting page**

Follow the following steps:

i. Select the pre-set Recipe action from the dropdown list of the "Index" field. Please note: the Recipe Index you select has to be enabled in Advanced Setting.

ii. Click "Save" button to save the settings. The popup window will be closed and return to the Rule settings page.

### 6.2.12 Rule Status

The Rule Status can be modified to be Disable or Enable in the Action. The editing page for Rule Status Action Setting is shown as below:

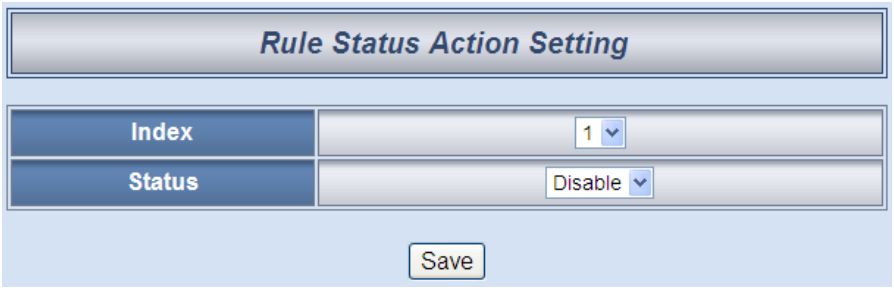



**Figure 6-29：Rule Status action setting page**

Follow the following steps:

i. Specify the index number of the Rule (It has to be a previously saved Rule) that is going to be changed in the Action Condition statement from the dropdown list of the "Index" field.

ii. Specify the Rule status to be Disable or Enable from the dropdown list of the "Status" field. When the Action being executed, the Rule status will be changed to specified status.

iii. Click "Save" button to save the settings. The Rule Status Action Setting page will be closed and return to the Rule setting page.

### 6.2.13 Data Logger

You can execute: "One-Time Log", "Start", "Stop" or "FTP Upload" for one-time log recording, start period recording or stop period recording in the Action statements. The three actions are described below:

- One-Time Log: Perform data recording one-time only when an THEN/ELSE action event is triggered.
- Stop: Stop period recording data. During the stop recording

interval, if the current Log file reached the “Close Log File” time interval and the file is closed, the file will still be sent via FTP or Email. The system will create a new Data Log file for One-Time Log recording.

- Start: Start period recording data.
- FTP Upload: If you select the option to send log files by FTP at a scheduled time, this action will force WISE-580x to upload log files immediately.

The editing page for Data Logger Action Setting is shown as below:

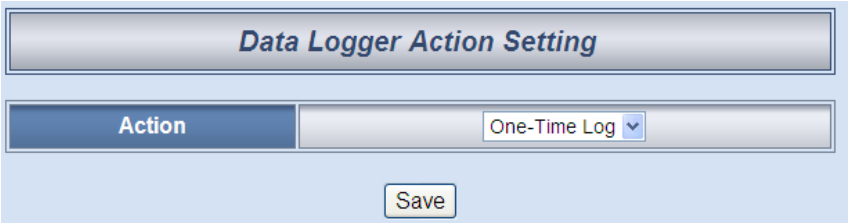



**Figure 6-30：Data Logger action setting page**

Follow the following steps:

i. In the “Action” field, select “One-Time Log”, “Start”, “Stop” or “FTP Upload” from the drop down list.

ii. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

### 6.2.14 SMS Alarm

WISE-5801 allows to send a specific SMS Alarm message in an Action. The setting page is show as below:

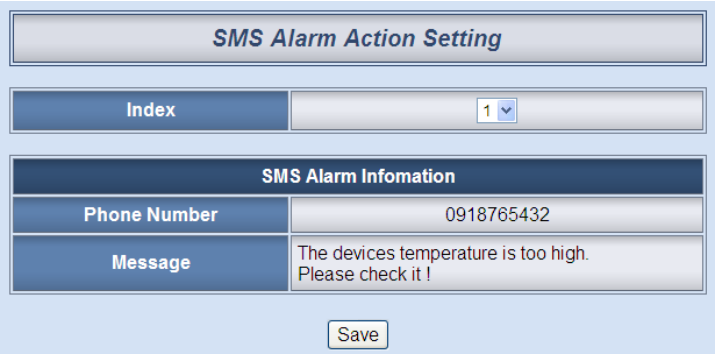



**Figure 6-31：SMS Alarm Action Setting Page**

Please follow the steps below：

i. In the “Index” field, specify the SMS Alarm index number you want to execute in Action from the dropdown list.

ii. The selected SMS Alarm message such as phone numbers and message content will be displayed for you to verify if this is the SMS Alarm you want to send.

iii. Click “Save” button to save the settings. The popup window will be closed and will return to the rule setting page.

## 6.3 Summary of the Rules

After you finish editing all IF condition and THEN / ELSE action statements for a rule, return to the Rules Setting page and click "Save" to save all settings of this rule. Please note: if you want to clear previous settings, after you click "Clear" button, you have to click "Save" to make sure this "Clear" status is saved. Rules Setting page is shown as below:

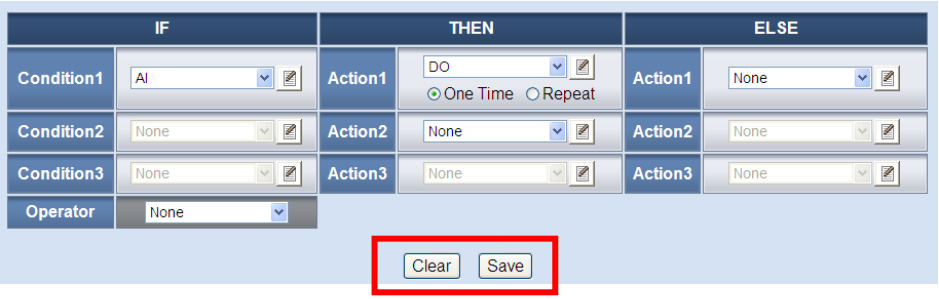



**Figure 6-32：Clear/Save Rules**

Each time you finish editing a Rule will go back to the Rules Setting main page. All statements of edited Rules will be displayed. Rules Setting main page is shown as below:

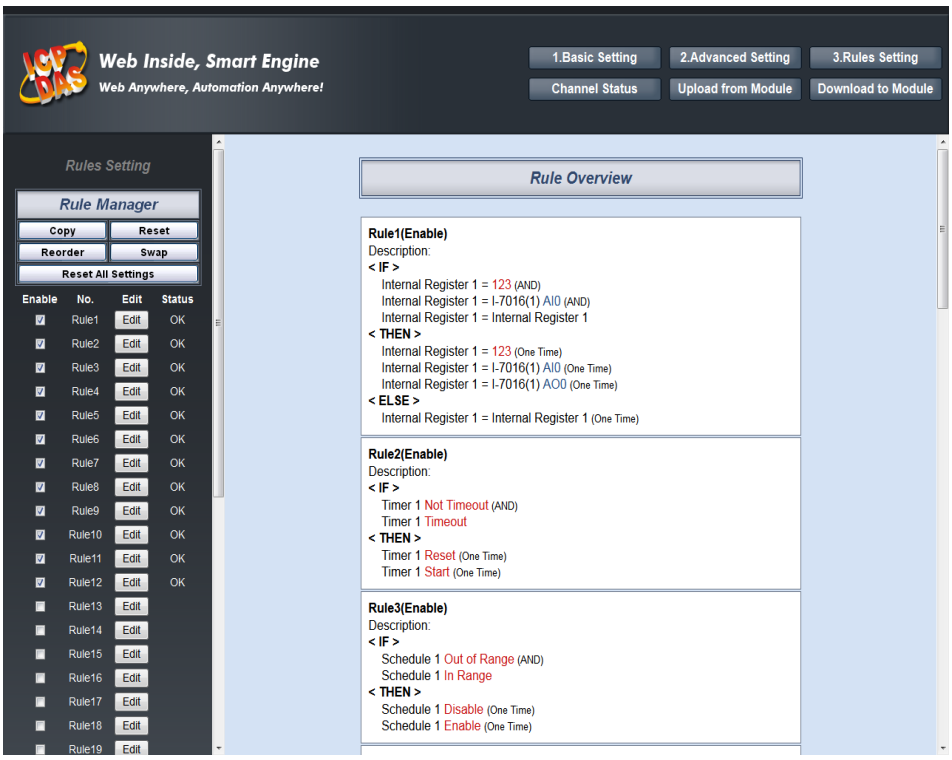



**Figure 6-33：Rule setting main page**

Click "Rules Setting" button to display detailed rules description. Rules can be downloaded to the hardware device immediately after you successfully set up one or more rule(s).

## 6.4 Rule Manager

The Rule Manager allows easy modification and deployment with existing rules. By a few simple steps, you can easily change the rule orders or make modification with previously edited rules. The Rule Manager table is shown as below:

**Figure 6-34：Rule Manager setting page**

Rule Manager offers 5 functions:

- **Copy**: Copy the content of previously edited rule to another rule. Click "Copy" button, a window as shown below will pop up. Select the source rule from the first field, and then select the destination(s) from the second fields (multiple rule destinations is allowed). Click "Save" button to copy the content of the source rule to all destination rules.

**Figure 6-35：Rule Copy setting page**

- **Reset**: Allows to clear rule content of previously edited rules. Click "Reset" button, a window as shown below will pop up. Rules that are previously edited will be listed on the page, select the rule to be cleared and then click "Save" button, the rule you select will be reset.

**Figure 6-36：Rule Reset setting page**

- **Reorder**: Reorder existing rules. Click "Reorder" button, a window as shown below will pop up. A menu will appear at the top of the page, it contains a drop down list for selecting the target rule, and a pair of "Move Up"/"Move Down" buttons to move target rule to the desired location. All rule locations will be listed in sequence (currently support 36 rule locations). If the rule content of a specific rule location has been previously edited, "Rule Content X" (X: rule sequence index) will appear. If the rule content of the rule location is blank, it will be specified as "None". To reorder a rule, select the target rule from the dropdown list, the corresponding "Rule content X" font will turn to bold black from its usual black. Click on "Move Up"/"Move Down" buttons to move the selected rule to the desired location and then click "Save" to save the settings.

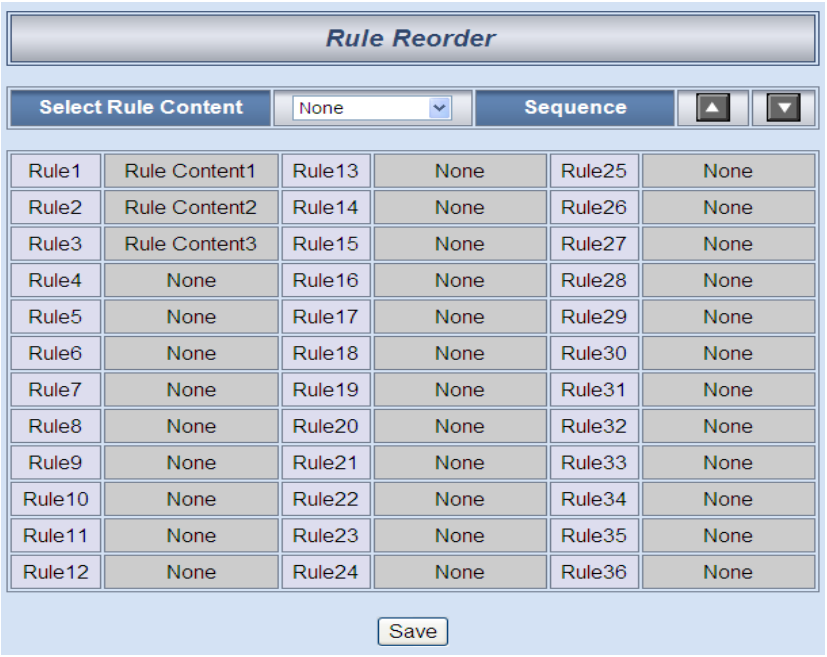

Rule Reorder
Select Rule Content
None
Sequence
Rule1 Rule Content1 Rule13 None Rule25 None
Rule2 Rule Content2 Rule14 None Rule26 None
Rule3 Rule Content3 Rule15 None Rule27 None
Rule4 None Rule16 None Rule28 None
Rule5 None Rule17 None Rule29 None
Rule6 None Rule18 None Rule30 None
Rule7 None Rule19 None Rule31 None
Rule8 None Rule20 None Rule32 None
Rule9 None Rule21 None Rule33 None
Rule10 None Rule22 None Rule34 None
Rule11 None Rule23 None Rule35 None
Rule12 None Rule24 None Rule36 None
Save

**Figure 6-37：Rule Reorder setting page**

- **Swap**: Exchange the Rule content of a pair of rules. Click Swap button, a window as shown below will pop up. From the left side drop down list, select the first rule (has to be previously edited), and select the second rule from the right side drop down list (the rule content can be blank), click “Save” to swap the rule content.

**Figure 6-38：Rule Swap setting page**

- Reset All Settings: Reset all settings and rules already done in “Basic Setting” page, “Advanced Setting” page and “Rule Setting” page. This function is used for the requirement to restart all setting of the controller. If you just want to reset all rules, you can use the “Reset” function in Rule Manager. After you click the “Reset All Settings” button inadvertently to reset all rules and settings, you can still retrieve all settings and rules from the controller and edit them again by pressing the “Upload from Module” button.

# 7 Download to Module

When there is a change being made on the Control Logic Setting page, such as add new logic or modify the settings, the "Download to Module" button on the right upper corner will change to orange color to remind you to press the button to download the rules to the module, the changes will take effect only after being downloaded to the module, as shown below:

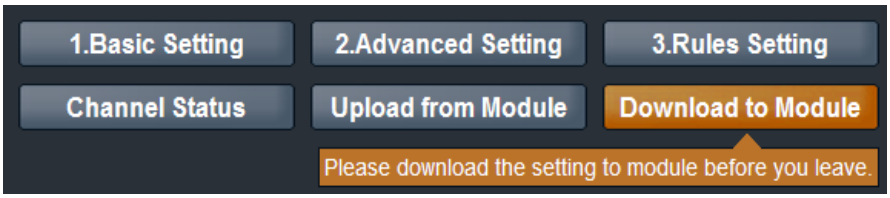



**Figure 7-1：Remind the user to press the "Download to Module"**

Click the "Download to Module" button to download the settings, when the download process is finished, the popup window will notify you the saving process is completed:

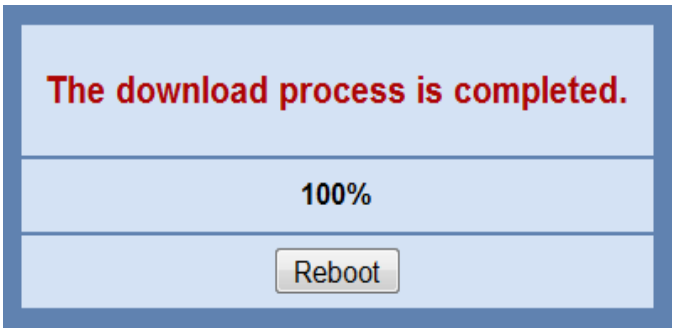



**Figure 7-2：Message showing a successful download**

Click "Reboot" button to complete the process and reboot the WISE controller. Now WISE will start to run the rules that have been downloaded. At this time, you can still edit or modify the content of the rules.

# 8 Upload from Module

"Upload from Module" button allows you to retrieve Rules Setting information from the hardware devices and edit them at this Rules Setting page. Click "Upload from Module" to start the upload process. When the upload process is finished, the window showing progress status will notify you the process is completed:

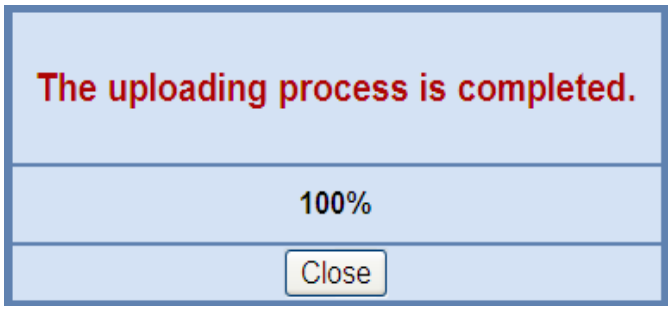
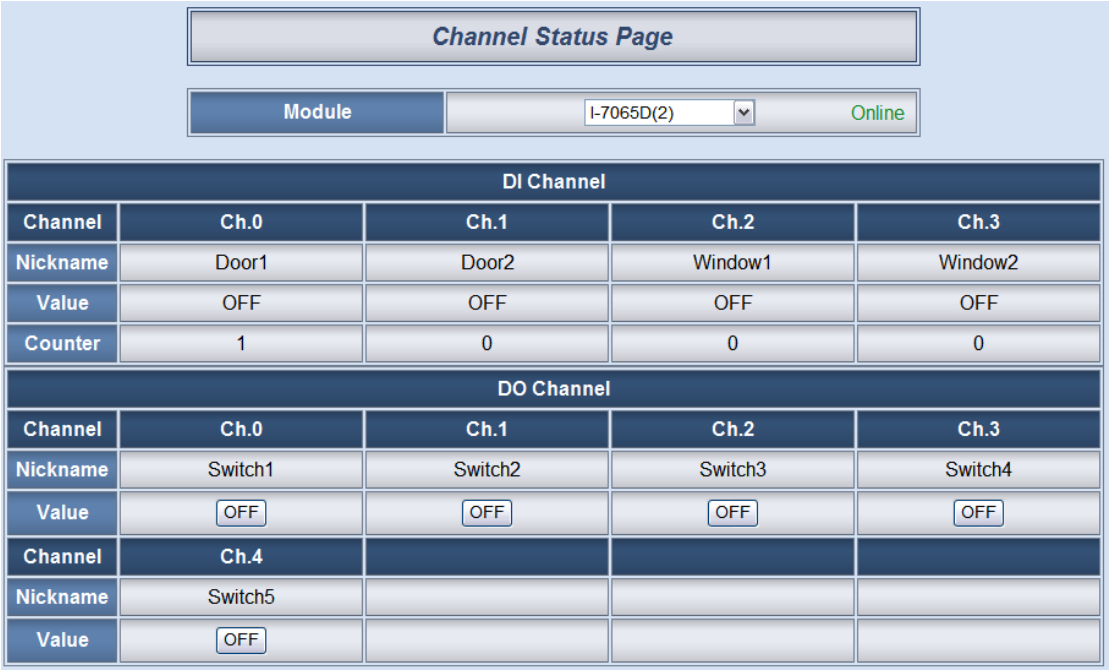



**Figure 8-1：Message showing a successful upload**

Click "close" to close the upload process window to finish upload. Now the rules have been uploaded from hardware devices to the web page, you can modify and download the edited rules to the hardware devices later again.

# 9 Channel Status

Channel Status function offers an easy to view monitoring page that allows you to view important controller information in real time without SCADA software. The Channel Status page is shown as below:



**Channel Status Page**

| Module | I-7065D(2) | Online |
|---|---|---|

| DI Channel | | | | |
|---|---|---|---|---|
| Channel | Ch.0 | Ch.1 | Ch.2 | Ch.3 |
| Nickname | Door1 | Door2 | Window1 | Window2 |
| Value | OFF | OFF | OFF | OFF |
| Counter | 1 | 0 | 0 | 0 |

| DO Channel | | | | |
|---|---|---|---|---|
| Channel | Ch.0 | Ch.1 | Ch.2 | Ch.3 |
| Nickname | Switch1 | Switch2 | Switch3 | Switch4 |
| Value | OFF | OFF | OFF | OFF |
| Channel | Ch.4 | | | |
| Nickname | Switch5 | | | |
| Value | OFF | | | |

**Figure 9-1：Channel Status page**

On the Channel Status page, by default it will display the system information of this WISE module such as: firmware version, system time, free space of the MicroSD card, MAC address of the modules and SMS information. In the “Module” field, select the I/O module (XW-Board, I-7000 module, or Modbus RTU/ TCP Slave module) that is connected to the WISE-580x or the Internal Register, the data of this module will be displayed on the page. If the module you select is a remote I/O module (such as: I-7000, Modbus RTU/TCP Slave module), the connection status(Online or Offline) of WISE and the I/O module will also be shown in the right side of the “Module” field. If you give nicknames to the I/O channels or Internal Registers, the nicknames will be shown on this page as well.

In addition ,you can click on the “Reboot” button to reboot WISE. You can also start/stop the SMS sending function by SMS switch on this page. You can modify the values of the DO channels for the I/O modules by clicking on the value buttons or input a new AO channel value on this page as well. This page will be updated once every 10 seconds, showing the latest data of the controllers.

# 10 Firmware Update

## 10.1 Introduction

WISE Firmware Uploader is a software tool provides a user-friendly interface to easily update WISE firmware that runs on WISE hardware devices. With a few clicks, you could upload the latest WISE firmware to the hardware.

System Requirements:

- Operating System: Windows Server 2003, Windows Server 2008, Windows XP, Windows Vista and Windows 7.
- Make sure you have installed Microsoft .NET Framework Version 2.0 (or later)
  - λ You can download Microsoft .Net Framework Version 2.0 from the link below: http://www.microsoft.com/downloads/details.aspx?FamilyID=0856eacb-4362-4b0d-8edd-aab15c5e04f5&DisplayLang=en
  - λ You can download Microsoft .Net Framework Version 3.5 from the link below: http://www.microsoft.com/downloads/details.aspx?familyid=333325FD-AE52-4E35-B531-508D977D32A6&displaylang=en

Please note: Make sure you use WISE Firmware Uploader V2.2 (or later) to perform WISE-580x firmware update.

## 10.2 Install / Uninstall WISE Firmware Uploader

### 10.2.1 Install WISE Firmware Uploader

Follow the steps below to install WISE Firmware Uploader:

- Obtain the WISE Firmware Uploader V2.2 setup file (WISE Firmware Uploader Setup V2.2.exe) or later.
- Double click the setup file to install the file, you will see a window pop up as below, click [Next] to continue.

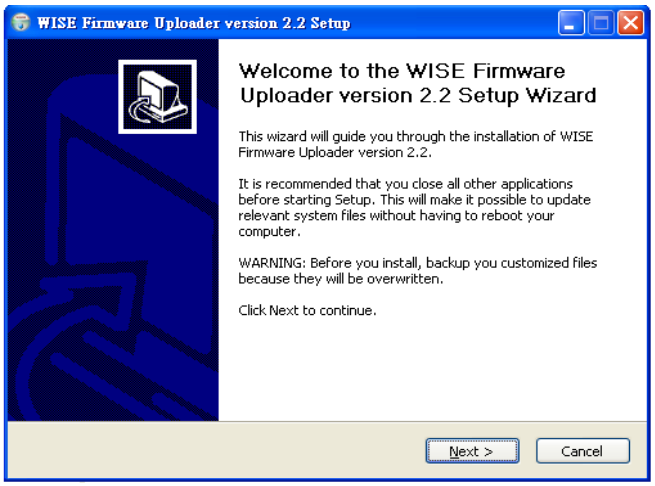

WISE Firmware Uploader version 2.2 Setup
Welcome to the WISE Firmware Uploader version 2.2 Setup Wizard
This wizard will guide you through the installation of WISE Firmware Uploader version 2.2.
It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.
WARNING: Before you install, backup you customized files because they will be overwritten.
Click Next to continue.
Next >
Cancel

**Figure 10-1：Install WISE Firmware Uploader**

- Choose the installation location to install WISE Firmware Uploader. Click [Install] to start the installation.

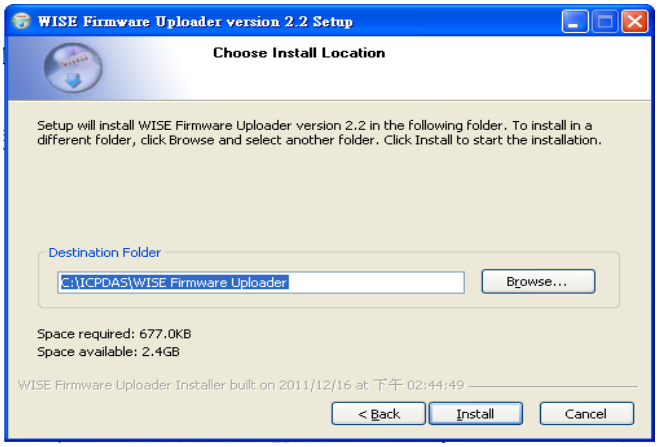

WISE Firmware Uploader version 2.2 Setup
Choose Install Location
Setup will install WISE Firmware Uploader version 2.2 in the following folder. To install in a different folder, click Browse and select another folder. Click Install to start the installation.
Destination Folder
C:\ICPDAS\WISE Firmware Uploader
Browse...
Space required: 677.0KB
Space available: 2.4GB
WISE Firmware Uploader Installer built on 2011/12/16 at 下午 02:44:49
< Back
Install
Cancel

**Figure 10-2：Select installation directory**

- The installation progress will be shown as below; please wait till the installation is completed.

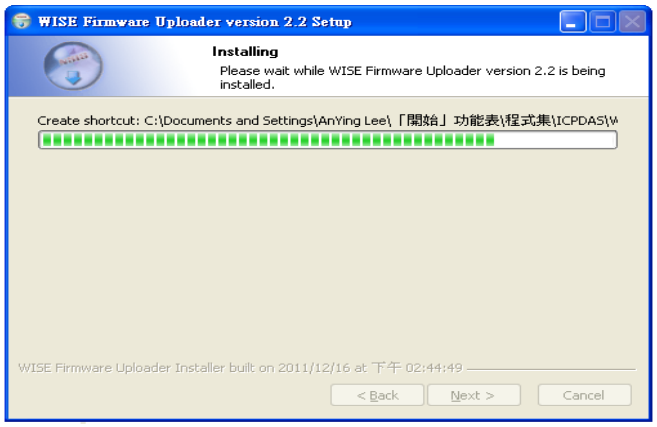

WISE Firmware Uploader version 2.2 Setup
Installing
Please wait while WISE Firmware Uploader version 2.2 is being installed.
Create shortcut: C:\Documents and Settings\AnYing Lee\「開始」功能表\程式集\ICPDAS\W
WISE Firmware Uploader Installer built on 2011/12/16 at 下午 02:44:49
< Back
Next >
Cancel

**Figure 10-3：Display installation progress**

- When the installation is completed, click [Finish] to close the process.

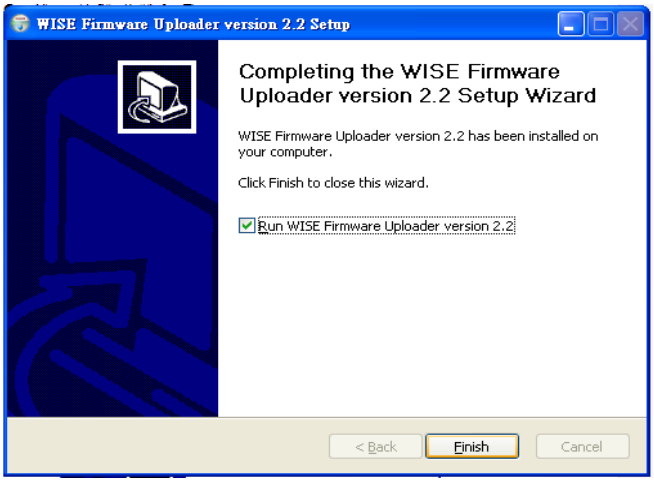

WISE Firmware Uploader version 2.2 Setup
Completing the WISE Firmware Uploader version 2.2 Setup Wizard
WISE Firmware Uploader version 2.2 has been installed on your computer.
Click Finish to close this wizard.
Run WISE Firmware Uploader version 2.2
< Back
Finish
Cancel

**Figure 10-4：Complete the installation**

### 10.2.2 Uninstall WISE Firmware Uploader

Follow the steps below to uninstall WISE Firmware Uploader:

- Click [Start]→ [All Programs]→[ICPDAS]→[WISE], and then click [Uninstall] under the [WISE] category.

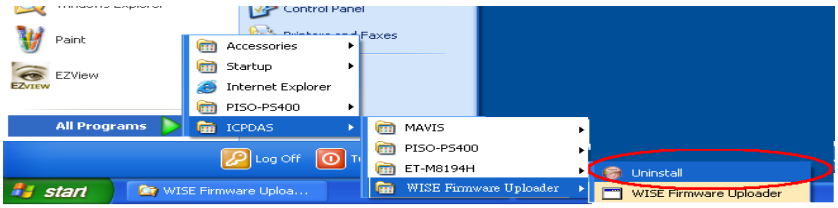



**Figure 10-5：Start to uninstall WISE Firmware Uploader**

- You will see a window pop up as below, click [Next] to continue.

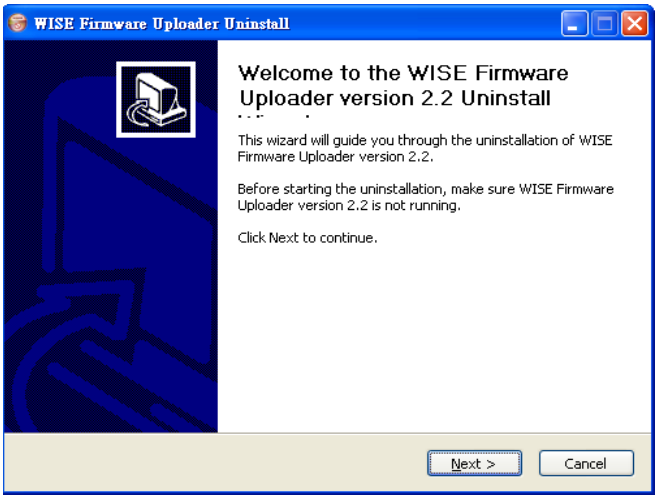

WISE Firmware Uploader Uninstall
Welcome to the WISE Firmware Uploader version 2.2 Uninstall
This wizard will guide you through the uninstallation of WISE Firmware Uploader version 2.2.
Before starting the uninstallation, make sure WISE Firmware Uploader version 2.2 is not running.
Click Next to continue.
Next >
Cancel

**Figure 10-6：Uninstall WISE Firmware Uploader (1)**

- Click [Uninstall] to uninstall the program.

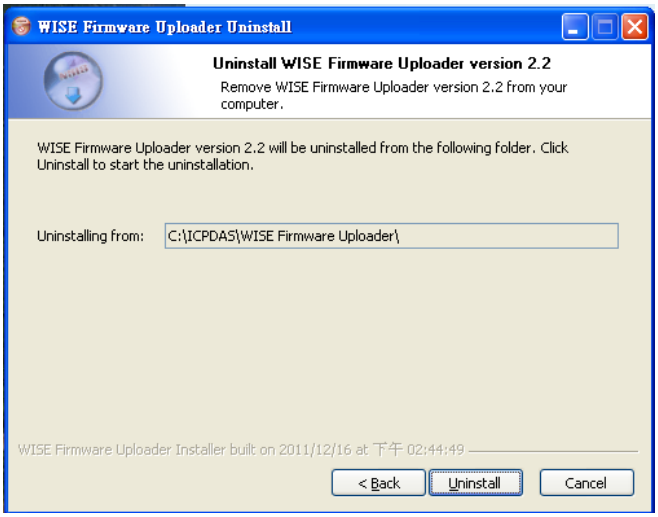

WISE Firmware Uploader Uninstall
Uninstall WISE Firmware Uploader version 2.2
Remove WISE Firmware Uploader version 2.2 from your computer.
WISE Firmware Uploader version 2.2 will be uninstalled from the following folder. Click Uninstall to start the uninstallation.
Uninstalling from:
C:\ICPDAS\WISE Firmware Uploader\
WISE Firmware Uploader Installer built on 2011/12/16 at 下午 02:44:49
< Back
Uninstall
Cancel

**Figure 10-7：Uninstall WISE Firmware Uploader (2)**

- When the uninstall process is completed, click [Finish] to finish the process.

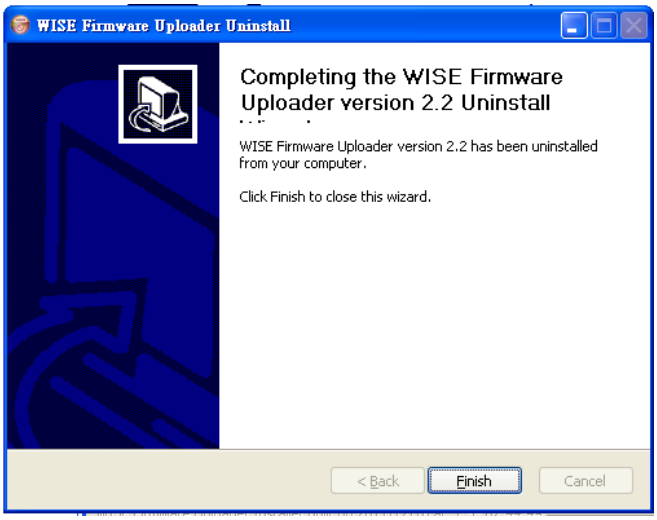

WISE Firmware Uploader Uninstall
Completing the WISE Firmware Uploader version 2.2 Uninstall
WISE Firmware Uploader version 2.2 has been uninstalled from your computer.
Click Finish to close this wizard.
< Back
Finish
Cancel

**Figure 10-8：Complete uninstalling WISE Firmware Uploader**

## 10.3 Update WISE firmware

Please follow the seven steps below to update the WISE firmware program on the hardware devices:

### i. Before update

- Please visit WISE product web site (http://wise.icpdas.com/) or contact ICP DAS service to obtain the latest version of the

WISE-580x firmware program. Copy the file to the computer that you previously installed WISE Firmware Uploader.

- Connect the WISE-580x (the one you are going to update WISE firmware) to the network. Please verify and make a note of the WISE -580x IP address, you will need it later in the process.

### ii. Execute WISE Firmware Uploader

- Taking Windows XP as an example: click [Start]→[All Programs]→[ICPDAS]→[WISE], and then click [WISE Firmware Uploader] under the [WISE] category to start the program.

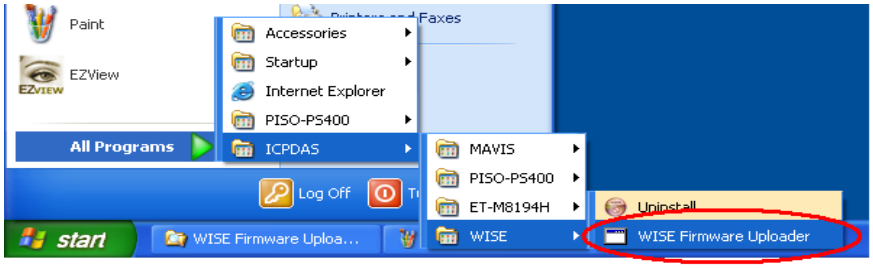



**Figure 10-9：Launch WISE Firmware Uploader**

### iii. Select WISE module type

Select the WISE module type from the dropdown list. Make sure the module type is WISE-580x, as shown in the following figure.

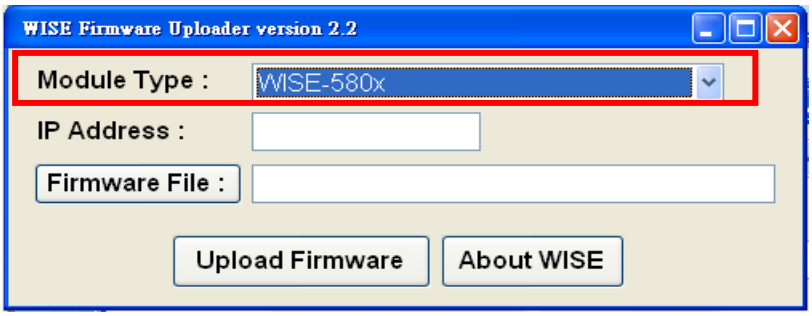



**Figure 10-10：Select the WISE module type**

### iv. Set up Module IP

Enter the IP address of the module that you are going to update WISE firmware, as shown in the following figure.

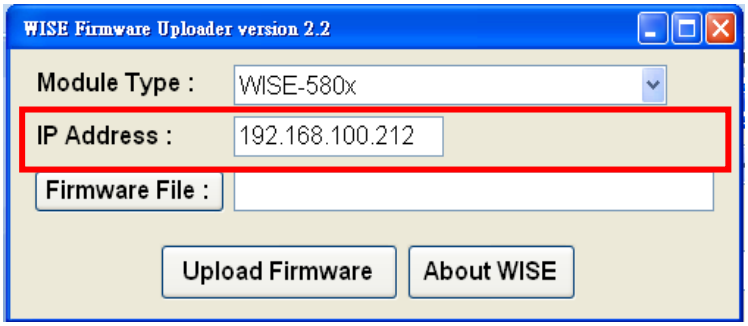



**Figure 10-11：Assign IP address**

v. Select WISE firmware file

Click “Firmware File” button; browse the file through the File Dialog Box to select the appropriate WISE firmware version, as shown in the following figure:

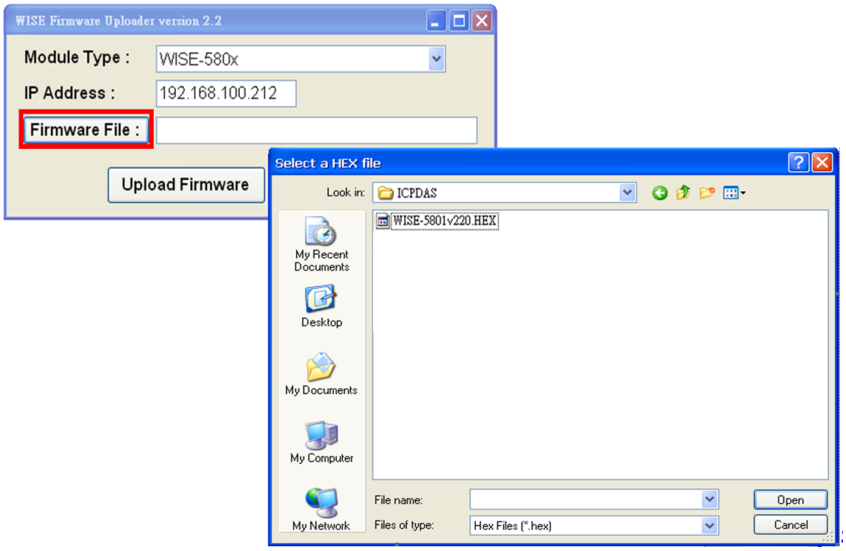



**Figure 10-12：Select the WISE firmware**

vi. Upload WISE firmware program

Click ”Upload Firmware” button to start update WISE firmware to the WISE module.

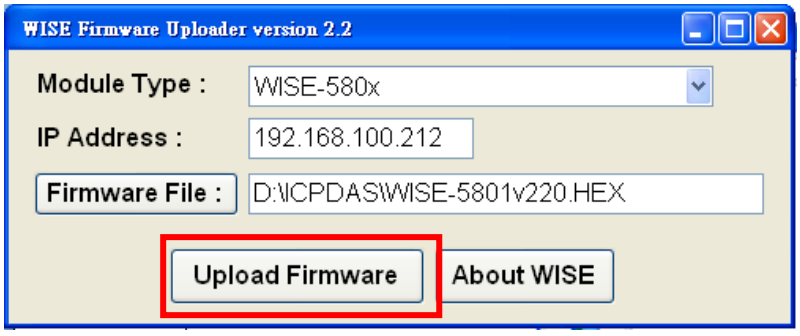



**Figure 10-13：Upload firmware**

The status of WISE firmware update progress will be shown as below:

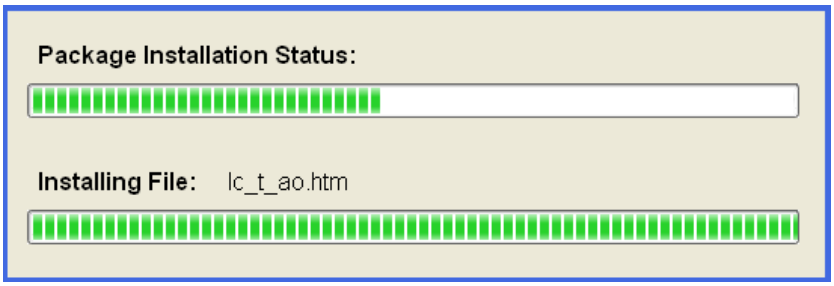



**Figure 10-14：Display firmware update progress(1)**

When the following figure is displayed, please wait for about 10 Secs; the WISE module is arranging the firmware files. Please note: this message will be displayed 4 times during the update process.

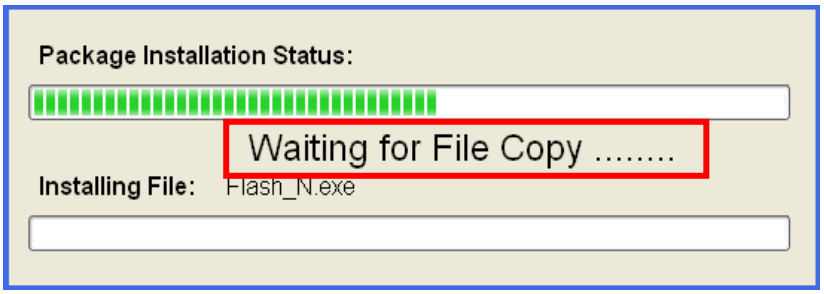



**Figure 10-15：Display firmware update progress(2)**

When the update of WISE firmware is completed, a pop-up window will appear to inform you. Close the window to finish firmware upload.

**Figure 10-16：Complete firmware update**

### vii. Module reboot automatically

After complete the firmware update process, WISE module will automatically reboot. The new updated firmware will take effect after the reboot.

# Appendix I：Modbus Address Table

WISE allows you to retrieve data on hardware devices via Modbus TCP/RTU protocol. WISE-580x register addresses are specified according to Modbus register mapping tables (more detailed information will follow).

**Please Note :**

- The addresses are in **Base 0** format
- The addresses are in **Decimal** format
- The **default value of NetID is 1**, and you can modify the NetID value in the Ethernet Setting page. (Please refer to 4.3 Ethernet Setting).
- If the data is displayed in Floating format or 32 bits (AI channel value, AO channel value or Internal Register, Input Register and Holding Register, etc.), each record of data will take two registers to hold the data. The following code example demonstrates how to join the two registers into one floating point value.

```
float register_to_float(short r1, short r2)
{
    float f;
    int *a = &f;
    *a = r1;
    a++;
    *a = r2;
    return f;
}
```

Please note: for the compilers are different (big endian or little endian) the floating point composing order might be different. For example: if r1 represent the address of 30040 register and r2 represent the address of 30041 register, to join r1 and r2 to a floating point, in the system is big endian system you will need to call:

```
float value = register_to_float(r1, r2);
```

Instead, if the system is little endian system, you will need to call:

```
float value = register_to_float(r2, r1);
```

Please note:

1. If you are not sure your editor belongs to which system, try both systems to find the accurate one.
2. The way to join the two registers value into DWORD is similar to Floating point; change the return value to DWORD or Unsigned Long.

**WISE-580x Modbus Register Address Table:**

● **Mode 1 : Support 16 I-7000 modules and 4 Modbus RTU Slave modules**

<table>
<tr><th>Modbus Address</th><th>00000<br>(Coils Output)</th><th>10000<br>(Discrete Input)</th><th>30000<br>(Input Registers)</th><th>40000<br>(Holding Registers)</th></tr>
<tr><td>0~19</td><td colspan="4">WISE-580x System Data</td></tr>
<tr><td>20~39</td><td colspan="4">XW Board Data</td></tr>
<tr><td>40~59</td><td></td><td>RS-485 module connection status</td><td>RS-485 module information</td><td rowspan="3">Internal Register Data</td></tr>
<tr><td>60-79</td><td></td><td></td><td>RS-485 module Error Code</td></tr>
<tr><td>80~139</td><td></td><td></td><td></td></tr>
<tr><td>140~179</td><td colspan="4">I-7000 Module Data (RS-485 address=1)</td></tr>
<tr><td>180~219</td><td colspan="4">I-7000 Module Data (RS-485 address=2)</td></tr>
<tr><td>220~259</td><td colspan="4">I-7000 Module Data (RS-485 address=3)</td></tr>
<tr><td>260~299</td><td colspan="4">I-7000 Module Data (RS-485 address=4)</td></tr>
<tr><td>300~339</td><td colspan="4">I-7000 Module Data (RS-485 address=5)</td></tr>
<tr><td>340~379</td><td colspan="4">I-7000 Module Data (RS-485 address=6)</td></tr>
<tr><td>380~419</td><td colspan="4">I-7000 Module Data (RS-485 address=7)</td></tr>
<tr><td>420~459</td><td colspan="4">I-7000 Module Data (RS-485 address=8)</td></tr>
<tr><td>460~499</td><td colspan="4">I-7000 Module Data (RS-485 address=9)</td></tr>
<tr><td>500~539</td><td colspan="4">I-7000 Module Data (RS-485 address=10)</td></tr>
<tr><td>540~579</td><td colspan="4">I-7000 Module Data (RS-485 address=11)</td></tr>
<tr><td>580~619</td><td colspan="4">I-7000 Module Data (RS-485 address=12)</td></tr>
<tr><td>620~659</td><td colspan="4">I-7000 Module Data (RS-485 address=13)</td></tr>
<tr><td>660~699</td><td colspan="4">I-7000 Module Data (RS-485 address=14)</td></tr>
<tr><td>700~739</td><td colspan="4">I-7000 Module Data (RS-485 address=15)</td></tr>
<tr><td>740~779</td><td colspan="4">I-7000 Module Data (RS 485 address=16)</td></tr>
<tr><td>780~879</td><td colspan="4">Modbus RTU Module Data (Modbus RTU address=17)</td></tr>
<tr><td>880~979</td><td colspan="4">Modbus RTU Module Data (Modbus RTU address=18)</td></tr>
<tr><td>980~1079</td><td colspan="4">Modbus RTU Module Data (Modbus RTU address=19)</td></tr>
<tr><td>1080~1179</td><td colspan="4">Modbus RTU Module Data (Modbus RTU address=20)</td></tr>
<tr><td>1230~1529</td><td colspan="4">The memory block for the I/O Table Data. The “I/O Data Table Configuration” setting of the “Active I/O Sending” function will be</td></tr>
</table>

| | |
|---|---|
| | stored in this block. The maximum address length is 300. There are two data arrangement options: ”Coil and Register” and “Register (Merge Coil into Register)”. |

● **Mode 2 : Support 10 Modbus RTU Slave modules**

<table>
<tr><th>Modbus Address</th><th>00000<br>(Coils Output)</th><th>10000<br>(Discrete Input)</th><th>30000<br>(Input Registers)</th><th>40000<br>(Holding Registers)</th></tr>
<tr><td>0~19</td><td colspan="4">WISE-580x System Data</td></tr>
<tr><td>20~39</td><td colspan="4">XW Board Data</td></tr>
<tr><td>40~59</td><td></td><td>RS-485 module connection status</td><td>RS-485 module information</td><td rowspan="3">Internal Register Data</td></tr>
<tr><td>60-79</td><td></td><td></td><td>RS-485 module Error Code</td></tr>
<tr><td>80~139</td><td></td><td></td><td></td></tr>
<tr><td>180~279</td><td colspan="4">Modbus RTU Module Data (Index=1)</td></tr>
<tr><td>280~379</td><td colspan="4">Modbus RTU Module Data (Index=2)</td></tr>
<tr><td>380~479</td><td colspan="4">Modbus RTU Module Data (Index=3)</td></tr>
<tr><td>480~579</td><td colspan="4">Modbus RTU Module Data (Index=4)</td></tr>
<tr><td>580~679</td><td colspan="4">Modbus RTU Module Data (Index=5)</td></tr>
<tr><td>680~779</td><td colspan="4">Modbus RTU Module Data (Index=6)</td></tr>
<tr><td>780~879</td><td colspan="4">Modbus RTU Module Data (Index=7)</td></tr>
<tr><td>880~979</td><td colspan="4">Modbus RTU Module Data (Index=8)</td></tr>
<tr><td>980~1079</td><td colspan="4">Modbus RTU Module Data (Index=9)</td></tr>
<tr><td>1080~1179</td><td colspan="4">Modbus RTU Module Data (Index=10)</td></tr>
<tr><td>1230~1529</td><td colspan="4">The memory block for the I/O Table Data. The “I/O Data Table Configuration” setting of the “Active I/O Sending” function will be stored in this block. The maximum address length is 300. There are two data arrangement options: ”Coil and Register” and “Register (Merge Coil into Register)”.</td></tr>
</table>

### 1. WISE-580x System Data：

This block stores the system information of WISE-580x, shown as below:

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Coil Output, Unit : Coil(8 Bits)** | | | | |
| Reboot switch | 00000 | 1 | Byte | 1=reboot |
| SMS switch | 00001 | 1 | Byte | 0=OFF, 1=ON |
| **Input Register, Unit : Register(16 Bits)** | | | | |
| Module Name | 30000 | 1 | Int | 0~65535 |
| XW-Board Name | 30001 | 1 | Int | 0~65535 |
| Firmware Version | 30002 | 2 | Float | Floating Point |
| Alive Counter | 30004 | 1 | Int | 0~65535 |
| Cycle Time | 30005 | 1 | Int | 0~65535 |
| MAC Address 1 | 30006 | 1 | Int | 0~255 |
| MAC Address 2 | 30007 | 1 | Int | 0~255 |
| MAC Address 3 | 30008 | 1 | Int | 0~255 |
| MAC Address 4 | 30009 | 1 | Int | 0~255 |
| MAC Address 5 | 30010 | 1 | Int | 0~255 |
| MAC Address 6 | 30011 | 1 | Int | 0~255 |
| Web Port | 30012 | 1 | Int | 0~60000 |
| Modbus TCP NetID | 30013 | 1 | Int | 0~255 |
| micro SD free space | 30014 | 1 | Int | 0~100(%) |
| Boot Date | 30015 | 2 | Long | ex. 20130424 |
| Boot Time | 30017 | 2 | Long | ex. 153024 |
| SMS Register Status | 30080 | 1 | Int | 1=OK |
| SMS Signal | 30081 | 1 | Int | 0~65535 |
| **Holding Register, Unit : Register(16 Bits)** | | | | |
| Ethernet IP 1 | 40000 | 1 | Int | 0~255 |
| Ethernet IP 2 | 40001 | 1 | Int | 0~255 |
| Ethernet IP 3 | 40002 | 1 | Int | 0~255 |
| Ethernet IP 4 | 40003 | 1 | Int | 0~255 |
| Subnet Mask 1 | 40004 | 1 | Int | 0~255 |
| Subnet Mask 2 | 40005 | 1 | Int | 0~255 |
| Subnet Mask 3 | 40006 | 1 | Int | 0~255 |
| Subnet Mask 4 | 40007 | 1 | Int | 0~255 |
| Gateway 1 | 40008 | 1 | Int | 0~255 |
| Gateway 2 | 40009 | 1 | Int | 0~255 |

| | | | | |
|---|---|---|---|---|
| Gateway 3 | 40010 | 1 | Int | 0~255 |
| Gateway 4 | 40011 | 1 | Int | 0~255 |

## 2. XW Board Data

This block stores information of XW-Board. For different XW-Board modules, the data will be store in different address, the following sections shows corresponding address information for different modules.

- XW107 / XW107i

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Coil Output, Unit : Coil(8 Bits)** | | | | |
| DO Ch.0 | 00020 | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.1 | 00021 | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.2 | 00022 | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.3 | 00023 | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.4 | 00024 | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.5 | 00025 | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.6 | 00026 | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.7 | 00027 | 1 | Byte | 0=OFF, 1=ON |
| **Discrete Input, Unit : Discrete Input (8 Bits)** | | | | |
| DI Ch.0 | 10020 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.1 | 10021 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.2 | 10022 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.3 | 10023 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.4 | 10024 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.5 | 10025 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.6 | 10026 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.7 | 10027 | 1 | Byte | 0=OFF, 1=ON |
| **Input Register, Unit : Register(16 Bits)** | | | | |
| DI Counter 0 | 30020 | 1 | Int | 0~65535 |
| DI Counter 1 | 30021 | 1 | Int | 0~65535 |
| DI Counter 2 | 30022 | 1 | Int | 0~65535 |
| DI Counter 3 | 30023 | 1 | Int | 0~65535 |
| DI Counter 4 | 30024 | 1 | Int | 0~65535 |
| DI Counter 5 | 30025 | 1 | Int | 0~65535 |
| DI Counter 6 | 30026 | 1 | Int | 0~65535 |
| DI Counter 7 | 30027 | 1 | Int | 0~65535 |

- XW110i

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Discrete Input, Unit : Discrete Input (8 Bits)** | | | | |
| DI Ch.0 | 10020 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.1 | 10021 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.2 | 10022 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.3 | 10023 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.4 | 10024 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.5 | 10025 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.6 | 10026 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.7 | 10027 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.8 | 10028 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.9 | 10029 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.10 | 10030 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.11 | 10031 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.12 | 10032 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.13 | 10033 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.14 | 10034 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.15 | 10035 | 1 | Byte | 0=OFF, 1=ON |
| **Input Register, Unit : Register(16 Bits)** | | | | |
| DI Counter 0 | 30020 | 1 | Int | 0~65535 |
| DI Counter 1 | 30021 | 1 | Int | 0~65535 |
| DI Counter 2 | 30022 | 1 | Int | 0~65535 |
| DI Counter 3 | 30023 | 1 | Int | 0~65535 |
| DI Counter 4 | 30024 | 1 | Int | 0~65535 |
| DI Counter 5 | 30025 | 1 | Int | 0~65535 |
| DI Counter 6 | 30026 | 1 | Int | 0~65535 |
| DI Counter 7 | 30027 | 1 | Int | 0~65535 |
| DI Counter 8 | 30028 | 1 | Int | 0~65535 |
| DI Counter 9 | 30029 | 1 | Int | 0~65535 |
| DI Counter 10 | 30030 | 1 | Int | 0~65535 |
| DI Counter 11 | 30031 | 1 | Int | 0~65535 |
| DI Counter 12 | 30032 | 1 | Int | 0~65535 |
| DI Counter 13 | 30033 | 1 | Int | 0~65535 |
| DI Counter 14 | 30034 | 1 | Int | 0~65535 |
| DI Counter 15 | 30035 | 1 | Int | 0~65535 |

- XW304

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Coil Output, Unit : Coil(8 Bits)** | | | | |
| DO Ch.0 | 00020 | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.1 | 00021 | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.2 | 00022 | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.3 | 00023 | 1 | Byte | 0=OFF, 1=ON |
| **Discrete Input, Unit : Discrete Input (8 Bits)** | | | | |
| DI Ch.0 | 10020 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.1 | 10021 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.2 | 10022 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.3 | 10023 | 1 | Byte | 0=OFF, 1=ON |
| **Input Register, Unit : Register(16 Bits)** | | | | |
| AI Ch.0 | 30020 | 2 | Float | -5 ~ +5 V |
| AI Ch.1 | 30022 | 2 | Float | -5 ~ +5 V |
| AI Ch.2 | 30024 | 2 | Float | -5 ~ +5 V |
| AI Ch.3 | 30026 | 2 | Float | -5 ~ +5 V |
| AI Ch.4 | 30028 | 2 | Float | -5 ~ +5 V |
| AI Ch.5 | 30030 | 2 | Float | -5 ~ +5 V |
| DI Counter 0 | 30032 | 1 | Int | 0~65535 |
| DI Counter 1 | 30033 | 1 | Int | 0~65535 |
| DI Counter 2 | 30034 | 1 | Int | 0~65535 |
| DI Counter 3 | 30035 | 1 | Int | 0~65535 |
| **Holding Register, Unit : Register(16 Bits)** | | | | |
| AO Ch.0 | 40020 | 2 | Float | -5 ~ +5 V |

- XW310 / XW310C(AI Differential mode)

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Coil Output, Unit : Coil(8 Bits)** | | | | |
| DO Ch.0 | 00020 | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.1 | 00021 | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.2 | 00022 | 1 | Byte | 0=OFF, 1=ON |
| **Discrete Input, Unit : Discrete Input (8 Bits)** | | | | |
| DI Ch.0 | 10020 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.1 | 10021 | 1 | Byte | 0=OFF, 1=ON |

| | | | | |
|---|---|---|---|---|
| DI Ch.2 | 10022 | 1 | Byte | 0=OFF, 1=ON |
| **Input Register, Unit : Register(16 Bits)** | | | | |
| AI Ch.0 | 30020 | 2 | Float | 310:-10 ~ +10 V<br>310C:0 ~ 20 mA |
| AI Ch.1 | 30022 | 2 | Float | 310:-10 ~ +10 V<br>310C:0 ~ 20 mA |
| AI Ch.2 | 30024 | 2 | Float | 310:-10 ~ +10 V<br>310C:0 ~ 20 mA |
| AI Ch.3 | 30026 | 2 | Float | 310:-10 ~ +10 V<br>310C:0 ~ 20 mA |
| DI Counter 0 | 30028 | 1 | Int | 0~65535 |
| DI Counter 1 | 30029 | 1 | Int | 0~65535 |
| DI Counter 2 | 30030 | 1 | Int | 0~65535 |
| **Holding Register, Unit : Register(16 Bits)** | | | | |
| AO Ch.0 | 40020 | 2 | Float | 310:-10 ~ +10 V<br>310C:0 ~ 20 mA |
| AO Ch.1 | 40022 | 2 | Float | 310:-10 ~ +10 V<br>310C:0 ~ 20 mA |

- XW310C(AI Single-End mode)

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Coil Output, Unit : Coil(8 Bits)** | | | | |
| DO Ch.0 | 00020 | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.1 | 00021 | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.2 | 00022 | 1 | Byte | 0=OFF, 1=ON |
| **Discrete Input, Unit : Discrete Input (8 Bits)** | | | | |
| DI Ch.0 | 10020 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.1 | 10021 | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.2 | 10022 | 1 | Byte | 0=OFF, 1=ON |
| **Input Register, Unit : Register(16 Bits)** | | | | |
| AI Ch.0 | 30020 | 2 | Float | 0 ~ 20 mA |
| AI Ch.1 | 30022 | 2 | Float | 0 ~ 20 mA |
| AI Ch.2 | 30024 | 2 | Float | 0 ~ 20 mA |
| AI Ch.3 | 30026 | 2 | Float | 0 ~ 20 mA |
| AI Ch.4 | 30028 | 2 | Float | 0 ~ 20 mA |
| AI Ch.5 | 30030 | 2 | Float | 0 ~ 20 mA |

| | | | | |
|---|---|---|---|---|
| AI Ch.6 | 30032 | 2 | Float | 0 ~ 20 mA |
| AI Ch.7 | 30034 | 2 | Float | 0 ~ 20 mA |
| DI Counter 0 | 30036 | 1 | Int | 0~65535 |
| DI Counter 1 | 30037 | 1 | Int | 0~65535 |
| DI Counter 2 | 30038 | 1 | Int | 0~65535 |
| **Holding Register, Unit : Register(16 Bits)** | | | | |
| AO Ch.0 | 40020 | 2 | Float | 0 ~ 20 mA |
| AO Ch.1 | 40022 | 2 | Float | 0 ~ 20 mA |

### 3. RS-485 Module Information

This block stores all module information that are connected with the WISE-580x through RS-485(COM2).

Table for **Mode 1(Support 16 I-7000 modules and 4 Modbus RTU Slave modules**):

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Input Register, Unit : Register(16 Bits)** | | | | |
| I-7000 Module Name (address 1~16) | 30040-30055 | 1 | Int | 7002~7088 |
| Modbus RTU Module (address 17~20) | 30056-30059 | 1 | Int | 1=Connected<br>0=No module |

Table for **Mode 2(Support 10 Modbus RTU Slave modules**):

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Input Register, Unit : Register(16 Bits)** | | | | |
| Modbus RTU Module (Index 1~10) | 30040-30049 | 1 | Int | Modbus Address |

### 4. RS-485 Module Error Code

This block stores the Error Code that is generated during the operation of modules that are connected with the WISE-580x through RS-485. The Error Code helps to quickly identify problems when experience communication difficulties.

Table for **Mode 1(Support 16 I-7000 modules and 4 Modbus RTU Slave modules**):

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Input Register, Unit : Register(16 Bits)** | | | | |
| Error Code of I-7000 (address 1~16) | 30060-30075 | 1 | Int | -32768~32767 |
| Error Code of Modbus RTU Slave (address 17~20) | 30076-30079 | 1 | Int | -32768~32767 |

Table for **Mode 2(Support 10 Modbus RTU Slave modules**):

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Input Register, Unit : Register(16 Bits)** | | | | |
| Error Code of Modbus RTU Slave (Index 1~10) | 30060-30069 | 1 | Int | -32768~32767 |

The Error Code list is as follow:

| Code | Description | Code | Description |
|---|---|---|---|
| 0 | No Error | -12 | Segment Error |
| -1 | Port Error | -13 | BaudRate Error |
| -2 | Data Error | -14 | CheckSum Error |
| -3 | Parity Error | -15 | Channel Error |
| -4 | Stop Error | -16 | BaudRate Error |
| -5 | TimeOut | -17 | TriggerLevel Error |
| -6 | Queue Empty | -18 | Date Error |
| -7 | Queue Overflow | -19 | Time Error |
| -8 | Pos Error | -20 | Out Of Memory |
| -9 | Addr Error | 99 | The I-7000 modules definition in WISE is not the same which WISE-580x really connects with. |
| -10 | Block Error | | |
| -11 | Write Error | | |

### 5. RS-485 Module Connection Status

This block stores the Connection Status of I/O modules that are connected with the WISE-580x through RS-485.

Table for **Mode 1(Support 16 I-7000 modules and 4 Modbus RTU Slave modules**):

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Discrete Input, Unit : Discrete Input (8 Bits)** | | | | |
| Connection status of I-7000 modules | 10040-10055 | 1 | Byte | 0=Offline, 1=Online |
| Connection status of Modbus RTU modules | 10056-10059 | 1 | Byte | 0=Offline, 1=Online |

Table for **Mode 2(Support 10 Modbus RTU Slave modules**):

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Discrete Input, Unit : Discrete Input (8 Bits)** | | | | |
| Connection status of Modbus RTU modules | 10040-10049 | 1 | Byte | 0=Offline, 1=Online |

### 6. Internal Register Data

This block stores 48 sets of Internal Register data provided by WISE controller.

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Holding Register, Unit : Register(16 Bits)** | | | | |
| Internal Register 01 | 40040 | 2 | Float | Floating Point |
| Internal Register 02 | 40042 | 2 | Float | Floating Point |
| Internal Register 03 | 40044 | 2 | Float | Floating Point |
| Internal Register 04 | 40046 | 2 | Float | Floating Point |
| Internal Register 05 | 40048 | 2 | Float | Floating Point |
| Internal Register 06 | 40050 | 2 | Float | Floating Point |
| Internal Register 07 | 40052 | 2 | Float | Floating Point |
| Internal Register 08 | 40054 | 2 | Float | Floating Point |
| Internal Register 09 | 40056 | 2 | Float | Floating Point |
| Internal Register 10 | 40058 | 2 | Float | Floating Point |
| …….. | | | | |
| Internal Register 45 | 40128 | 2 | Float | Floating Point |
| Internal Register 46 | 40130 | 2 | Float | Floating Point |
| Internal Register 47 | 40132 | 2 | Float | Floating Point |
| Internal Register 48 | 40134 | 2 | Float | Floating Point |

### 7. I-7000 Module Data

This block stores all I-7000 modules I/O channel data. Each WISE-580x supports up to 16 I-7000 modules. The starting Modbus address of the data block is 140 and each I-7000 module takes 40 addresses. The Modbus address of I / O channel of each module is in sequence arrangement from the starting address.

The following is an example of an I-7000 module using RS-485 Address 1:

| Modbus Address | I-7000 Module Data of **RS-485 address 1** | | | |
|---|---|---|---|---|
| | 00000 **(Coils Output)** | 10000 **(Discrete Input)** | 30000 **(Input Registers)** | 40000 **(Holding Registers)** |
| 140 ~ 179 | DO Channel Value | DI Channel Value | AI Channel Value & DI Counter Vale | AO Channel Value |

I-7000 module Modbus Address starts from different initial address, therefore the I/O channels Modbus Address of the modules will also be different if it starts from different RS-485 address. To calculate the I/O channels Modbus Address of I-7000 module, please follow the steps below:

- Get the RS-485 address of the I-7000 module
- Calculate the parameter **N** by the following format:
  **N = (I-7000 RS-485 address - 1) x 40**
- Check the I-7000 module Modbus TCP Address Table to calculate the I/O channel Modbus TCP Address with **N** value for the I-7000 module.

According to I-7000 module RS-485 addresses, each module's N value is different. For example: The N value of I-7000 module with RS-485 Address 1 is (1-1) * 40 = 0, the N value of I-7000 module with RS-485 Address 2 is (2-1) * 40 = 40, the N value of I-7000 module with RS-485 Address 3 is (3-1) * 40 = 80…..…and the N value of I-7000 module with RS-485 Address 16 is (16-1) * 40 = 600. The I-7000 module Modbus Address Table is shown as below:

- **I-7011、I-7012、I-7014 (1 DI、2 DO、1 AI channel)**

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Coils Output, Unit : Coil(8 Bits)** | | | | |
| DO Ch.0 | 00140 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.1 | 00141 + N | 1 | Byte | 0=OFF, 1=ON |

| **Discrete Input, Unit : Discrete Input (8 Bits)** | | | | |
|---|---|---|---|---|
| DI Ch.0 | 10140 + N | 1 | Byte | 0=OFF, 1=ON |
| **Input Register, Unit : Register(16 Bits)** | | | | |
| AI Ch.0 | 30140 + N | 2 | Float | By Channel Type Setting |
| DI Counter 0 | 30142 + N | 1 | Int | 0~65535 |

- **I-7013 (1 DI channel)**

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Discrete Input, Unit : Discrete Input (8 Bits)** | | | | |
| DI Ch.0 | 10140 + N | 1 | Byte | 0=OFF, 1=ON |
| **Input Register, Unit : Register(16 Bits)** | | | | |
| DI Counter 0 | 30140 + N | 1 | Int | 0~65535 |

- **I-7015 (6 AI channel)**

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Input Register, Unit : Register(16 Bits)** | | | | |
| AI Ch.0 | 30140 + N | 2 | Float | By Channel Type Setting |
| AI Ch.1 | 30142 + N | 2 | Float | By Channel Type Setting |
| AI Ch.2 | 30144 + N | 2 | Float | By Channel Type Setting |
| AI Ch.3 | 30146 + N | 2 | Float | By Channel Type Setting |
| AI Ch.4 | 30148 + N | 2 | Float | By Channel Type Setting |
| AI Ch.5 | 30150 + N | 2 | Float | By Channel Type Setting |

- **I-7005、I-7017、I-7018、I-7019 (8 AI channel)**

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Input Register, Unit : Register(16 Bits)** | | | | |
| AI Ch.0 | 30140 + N | 2 | Float | By Channel Type Setting |

| | | | | |
|---|---|---|---|---|
| AI Ch.1 | 30142 + N | 2 | Float | By Channel Type Setting |
| AI Ch.2 | 30144 + N | 2 | Float | By Channel Type Setting |
| AI Ch.3 | 30146 + N | 2 | Float | By Channel Type Setting |
| AI Ch.4 | 30148 + N | 2 | Float | By Channel Type Setting |
| AI Ch.5 | 30150 + N | 2 | Float | By Channel Type Setting |
| AI Ch.6 | 30152 + N | 2 | Float | By Channel Type Setting |
| AI Ch.7 | 30154 + N | 2 | Float | By Channel Type Setting |

Please note: for different modules of I-7017 and I-7018, the numbers of channel might be different; the address of each channel will follow in sequences.

- **I-7021 (1 AO channel)**

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Holding Register, Unit : Register(16 Bits)** | | | | |
| AO Ch.0 | 40140 + N | 2 | Float | By Channel Type Setting |

- **I-7022 (2 AO channel)**

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Holding Register, Unit : Register(16 Bits)** | | | | |
| AO Ch.0 | 40140 + N | 2 | Float | By Channel Type Setting |
| AO Ch.1 | 40142 + N | 2 | Float | By Channel Type Setting |

- **I-7024 (4 AO channel)**

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Holding Register, Unit : Register(16 Bits)** | | | | |
| AO Ch.0 | 40140 + N | 2 | Float | By Channel |

| | | | | |
|---|---|---|---|---|
| | | | | Type Setting |
| AO Ch.1 | 40142 + N | 2 | Float | By Channel Type Setting |
| AO Ch.2 | 40144 + N | 2 | Float | By Channel Type Setting |
| AO Ch.3 | 40146 + N | 2 | Float | By Channel Type Setting |

- **I-7024R (5 DI、4 AO channel)**

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Discrete Inputs, Unit : Discrete Input (8 Bits)** | | | | |
| DI Ch.0 | 10140 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.1 | 10141 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.2 | 10142 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.3 | 10143 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.4 | 10144 + N | 1 | Byte | 0=OFF, 1=ON |
| **Input Register, Unit : Register(16 Bits)** | | | | |
| DI Counter 0 | 30140 + N | 1 | Int | 0~65535 |
| DI Counter 1 | 30141 + N | 1 | Int | 0~65535 |
| DI Counter 2 | 30142 + N | 1 | Int | 0~65535 |
| DI Counter 3 | 30143 + N | 1 | Int | 0~65535 |
| DI Counter 4 | 30144 + N | 1 | Int | 0~65535 |
| **Holding Register, Unit : Register(16 Bits)** | | | | |
| AO Ch.0 | 40140 + N | 2 | Float | By Channel Type Setting |
| AO Ch.1 | 40142 + N | 2 | Float | By Channel Type Setting |
| AO Ch.2 | 40144 + N | 2 | Float | By Channel Type Setting |
| AO Ch.3 | 40146 + N | 2 | Float | By Channel Type Setting |

- **I-7033 (3 AI channel)**

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Input Register, Unit : Register(16 Bits)** | | | | |

| | | | | |
|---|---|---|---|---|
| AI Ch.0 | 30140 + N | 2 | Float | By Channel Type Setting |
| AI Ch.1 | 30142 + N | 2 | Float | By Channel Type Setting |
| AI Ch.2 | 30144 + N | 2 | Float | By Channel Type Setting |

- **I-7000 DI/DO Module (Maxinum 16 DI channel / 16 DO channel)**
  According to the channel numbers of I-7000 DI/DO Module, you can look up the address of the I-7000 DI/DO Module channel from the following table:

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Coil Output, Unit : Coil(8 Bits)** | | | | |
| DO Ch.0 | 00140 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.1 | 00141 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.2 | 00142 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.3 | 00143 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.4 | 00144 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.5 | 00145 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.6 | 00146 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.7 | 00147 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.8 | 00148 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.9 | 00149 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.10 | 00150 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.11 | 00151 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.12 | 00152 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.13 | 00153 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.14 | 00154 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.15 | 00155 + N | 1 | Byte | 0=OFF, 1=ON |
| **Discrete Input, Unit : Discrete Input (8 Bits)** | | | | |
| DI Ch.0 | 10140 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.1 | 10141 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.2 | 10142 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.3 | 10143 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.4 | 10144 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.5 | 10145 + N | 1 | Byte | 0=OFF, 1=ON |

| | | | | |
|---|---|---|---|---|
| DI Ch.6 | 10146 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.7 | 10147 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.8 | 10148 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.9 | 10149 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.10 | 10150 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.11 | 10151 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.12 | 10152 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.13 | 10153 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.14 | 10154 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.15 | 10155 + N | 1 | Byte | 0=OFF, 1=ON |
| **Input Register, Unit : Register(16 Bits)** | | | | |
| DI Counter 0 | 30140 + N | 1 | Int | 0~65535 |
| DI Counter 1 | 30141 + N | 1 | Int | 0~65535 |
| DI Counter 2 | 30142 + N | 1 | Int | 0~65535 |
| DI Counter 3 | 30143 + N | 1 | Int | 0~65535 |
| DI Counter 4 | 30144 + N | 1 | Int | 0~65535 |
| DI Counter 5 | 30145 + N | 1 | Int | 0~65535 |
| DI Counter 6 | 30146 + N | 1 | Int | 0~65535 |
| DI Counter 7 | 30147 + N | 1 | Int | 0~65535 |
| DI Counter 8 | 30148 + N | 1 | Int | 0~65535 |
| DI Counter 9 | 30149 + N | 1 | Int | 0~65535 |
| DI Counter 10 | 30150 + N | 1 | Int | 0~65535 |
| DI Counter 11 | 30151 + N | 1 | Int | 0~65535 |
| DI Counter 12 | 30152 + N | 1 | Int | 0~65535 |
| DI Counter 13 | 30153 + N | 1 | Int | 0~65535 |
| DI Counter 14 | 30154 + N | 1 | Int | 0~65535 |
| DI Counter 15 | 30155 + N | 1 | Int | 0~65535 |

- **I-7080 (2 Counter/Frequency、2 DO channel)**

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Coil Output, Unit : Coil(8 Bits)** | | | | |
| DO Ch.0 | 00140 + N | 1 | Byte | 0=OFF, 1=ON |
| DO Ch.1 | 00141 + N | 1 | Byte | 0=OFF, 1=ON |
| **Input Register, Unit : Register(16 Bits)** | | | | |
| DI Counter 0 | 30140 + N | 2 | DWORD | 0~4294967295 |
| DI Counter 1 | 30142 + N | 2 | DWORD | 0~4294967295 |

- **I-7088 (8 DI、8 PWM Output channel)**

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Coil Output, Unit : Coil(8 Bits)** | | | | |
| PWM Output Ch.0 | 00140 + N | 1 | Byte | 0=OFF, 1=ON |
| PWM Output Ch.1 | 00141 + N | 1 | Byte | 0=OFF, 1=ON |
| PWM Output Ch.2 | 00142 + N | 1 | Byte | 0=OFF, 1=ON |
| PWM Output Ch.3 | 00143 + N | 1 | Byte | 0=OFF, 1=ON |
| PWM Output Ch.4 | 00144 + N | 1 | Byte | 0=OFF, 1=ON |
| PWM Output Ch.5 | 00145 + N | 1 | Byte | 0=OFF, 1=ON |
| PWM Output Ch.6 | 00146 + N | 1 | Byte | 0=OFF, 1=ON |
| PWM Output Ch.7 | 00147 + N | 1 | Byte | 0=OFF, 1=ON |
| **Discrete Input, Unit : Discrete Input (8 Bits)** | | | | |
| DI Ch.0 | 10140 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.1 | 10141 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.2 | 10142 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.3 | 10143 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.4 | 10144 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.5 | 10145 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.6 | 10146 + N | 1 | Byte | 0=OFF, 1=ON |
| DI Ch.7 | 10147 + N | 1 | Byte | 0=OFF, 1=ON |
| **Input Register, Unit : Register(16 Bits)** | | | | |
| DI Counter 0 | 30140 + N | 2 | DWORD | 0~4294967295 |
| DI Counter 1 | 30142 + N | 2 | DWORD | 0~4294967295 |
| DI Counter 2 | 30144 + N | 2 | DWORD | 0~4294967295 |
| DI Counter 3 | 30146 + N | 2 | DWORD | 0~4294967295 |
| DI Counter 4 | 30148 + N | 2 | DWORD | 0~4294967295 |
| DI Counter 5 | 30150 + N | 2 | DWORD | 0~4294967295 |
| DI Counter 6 | 30152 + N | 2 | DWORD | 0~4294967295 |
| DI Counter 7 | 30154 + N | 2 | DWORD | 0~4294967295 |

- **DL-100 (3 AI channel)**

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Input Register, Unit : Register(16 Bits)** | | | | |
| Humidity | 30140 + N | 2 | Float | By Channel Type Setting |
| Temperature(˚C) | 30142 + N | 2 | Float | By Channel Type Setting |
| Temperature(˚F) | 30144 + N | 2 | Float | By Channel Type Setting |

- **DL-302 (6 AI channel)**

| Parameter Name | Modbus Address | Length | Data Type | Range |
|---|---|---|---|---|
| **Input Register, Unit : Register(16 Bits)** | | | | |
| CO2 (ppm) | 30140 + N | 2 | Float | By Channel Type Setting |
| Humidity | 30142 + N | 2 | Float | By Channel Type Setting |
| Temperature(˚C) | 30144 + N | 2 | Float | By Channel Type Setting |
| Temperature(˚F) | 30146 + N | 2 | Float | By Channel Type Setting |
| Dew Point Temperature(˚C) | 30148 + N | 2 | Float | By Channel Type Setting |
| Dew Point Temperature(˚F) | 30150 + N | 2 | Float | By Channel Type Setting |

## 8. Modbus RTU Module Data

This block stores all Modbus RTU modules I/O channel data in WISE-580x. If the I/O module connection mode of the WISE-580x is set as Mode 1(Support 16 I-7000 modules and 4 Modbus RTU Slave modules), it allows the WISE-580x to support up to 4 Modbus RTU Slave modules (Modbus RTU Address Range: 17~20). The starting Modbus address of the data block is 780 and each Modbus RTU module takes 100 addresses. Please refer to the following table.

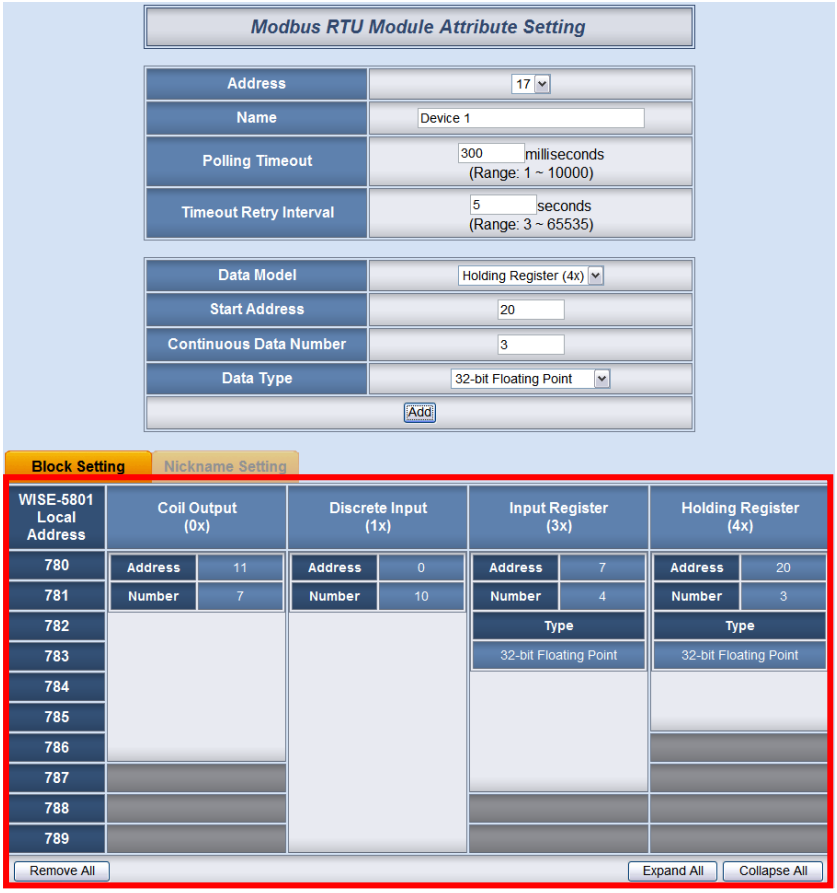
| WISE-580x Modbus Address | 00000 **(Coil Output)** | 10000 **(Discrete Input)** | 30000 **(Input Register)** | 40000 **(Holding Register)** |
|---|---|---|---|---|
| 780~879 | Modbus RTU Module Data (Modbus RTU address=17) | | | |
| 880~979 | Modbus RTU Module Data (Modbus RTU address=18) | | | |
| 980~1079 | Modbus RTU Module Data (Modbus RTU address=19) | | | |
| 1080~1179 | Modbus RTU Module Data (Modbus RTU address=20) | | | |

If the I/O module connection mode of the WISE-580x is set as Mode 2(Support 10 Modbus RTU Slave modules), it allows the WISE-580x to support up to 10 Modbus RTU Slave modules. According to the Index number being assigned to that Modbus RTU module, each module takes specific Modbus address data block. The starting Modbus address of the data block is 180 and each Modbus RTU module takes 100 addresses. Please refer to the following table.

| WISE-580x Modbus Address | 00000 **(Coil Output)** | 10000 **(Discrete Input)** | 30000 **(Input Register)** | 40000 **(Holding Register)** |
|---|---|---|---|---|
| 180~279 | Modbus RTU Module Data(Index = 1) | | | |
| 280~379 | Modbus RTU Module Data(Index = 2) | | | |
| 380~479 | Modbus RTU Module Data(Index = 3) | | | |
| 480~579 | Modbus RTU Module Data(Index = 4) | | | |
| 580~679 | Modbus RTU Module Data(Index = 5) | | | |
| 680~779 | Modbus RTU Module Data(Index = 6) | | | |
| 780~879 | Modbus RTU Module Data(Index = 7) | | | |
| 880~979 | Modbus RTU Module Data(Index = 8) | | | |
| 980~1079 | Modbus RTU Module Data(Index = 9) | | | |
| 1080~1179 | Modbus RTU Module Data(Index = 10) | | | |

The allocation of the Modbus address of I / O channel for each Modbus RTU module is in sequence arrangement from the module starting address. Please refer to the following example.

The Modbus RTU module's name is Device1, the following figure shows the settings of this module. For this Modbus RTU module's address is 17, its starting address in WISE-580x Modbus address table will be 780.




| Modbus Data Model | The Starting Address of Modbus RTU Module (Device1) | Continuous Data Number |
|---|---|---|
| Coil Output | 00011 | 7 |
| Discrete Input | 00000 | 10 |
| Input Register | 00007 | 4 (32-bit Floating Point) |
| Holding Register | 00020 | 3 (32-bit Floating Point) |

- The allocation of the Modbus Address in WISE-580x for the Coil Output setting of this Modbus RTU module(Device1) is shown as below:

| Coil Output Index | The Modbus Address in Modbus RTU Module(Device1) | The mapping Modbus Address in WISE-580x |
|---|---|---|
| 1 | 00011 | 00780 |
| 2 | 00012 | 00781 |
| 3 | 00013 | 00782 |
| 4 | 00014 | 00783 |

| | | |
|---|---|---|
| 5 | 00015 | 00784 |
| 6 | 00016 | 00785 |
| 7 | 00017 | 00786 |

- The allocation of the Modbus Address in WISE-580x for the Discrete Input setting of this Modbus RTU module(Device1) is shown as below:

| Discrete Input Index | The Modbus Address in Modbus RTU Module(Device1) | The mapping Modbus Address in WISE-580x |
|---|---|---|
| 1 | 10000 | 10780 |
| 2 | 10001 | 10781 |
| 3 | 10002 | 10782 |
| 4 | 10003 | 10783 |
| 5 | 10004 | 10784 |
| 6 | 10005 | 10785 |
| 7 | 10006 | 10786 |
| 8 | 10007 | 10787 |
| 9 | 10008 | 10788 |
| 10 | 10009 | 10789 |

- The allocation of the Modbus Address in WISE-580x for the Input Register setting of this Modbus RTU module(Device1) is shown as below:

| Input Register Index | The Modbus Address in Modbus RTU Module(Device1) | The mapping Modbus Address in WISE-580x |
|---|---|---|
| 1 | 30007 | 30780 |
| 2 | 30009 | 30782 |
| 3 | 30011 | 30784 |
| 4 | 30013 | 30786 |

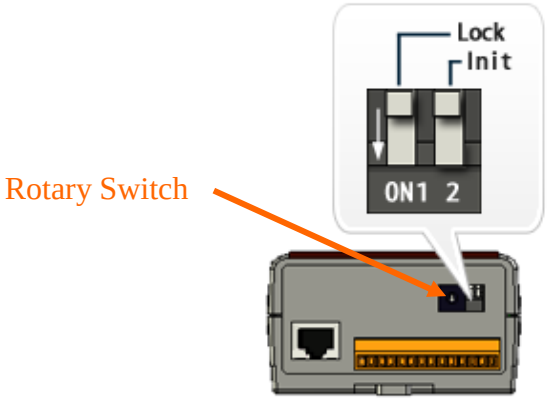
- The allocation of the Modbus Address in WISE-580x for the Holding Register setting of this Modbus RTU module(Device1) is shown as below:

| Holding Register Index | The Modbus Address in Modbus RTU Module(Device1) | The mapping Modbus Address in WISE-580x |
|---|---|---|
| 1 | 40020 | 40780 |
| 2 | 40022 | 40782 |
| 3 | 40024 | 40784 |

# Appendix II：Reset to Factory Default Setting

During the operation of WISE-580x, if the hardware system setting data is lost or encounters any abnormal problem that you would like to reset the system to factory default, please follow the steps below:

1. Power off the WISE-580x, make sure the Init Switch is in the “OFF” position.




2. Switch Rotary Switch to position 1 to restore to factory default, the position of Rotary Switch indicates:

<table>
<tr><th>Rotary Switch</th><th>Function</th></tr>
<tr><td>0</td><td>Execute WISE-580x firmware</td></tr>
<tr><td>1</td><td>● Restore Web Page display language to factory default (English)<br>● Restore network settings to factory default
<table>
<tr><td>IP Address</td><td>192.168.255.1</td></tr>
<tr><td>Subnet Mask</td><td>255.255.0.0</td></tr>
<tr><td>Gateway</td><td>192  168.0.1</td></tr>
<tr><td>Modbus TCP NetID</td><td>1</td></tr>
<tr><td>Port for Web Server</td><td>80</td></tr>
</table></td></tr>
<tr><td>A</td><td>Reset the login password to "wise"</td></tr>
<tr><td>B</td><td>Delete the rule file</td></tr>
<tr><td>D</td><td>Fully restore to factory default (executing this action is equivalent to executing 1, A, B, actions)<br>PS: This action does not restore firmware. If the firmware update fails or is damaged, please follow section 10.3 to reinstall the firmware.</td></tr>
</table>

3. Connect WISE-580x to the power, when the L2 green light turns to be ON, it indicates that the setting is completed.

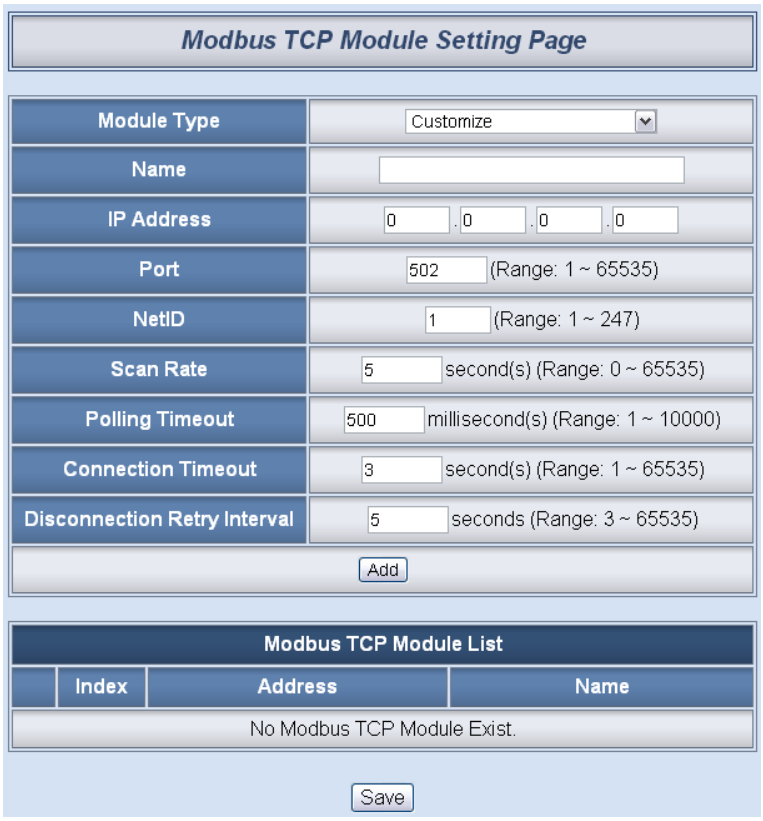
4. Power off WISE-580x and switch Rotary Switch back to “0” position. Power on WISE-580x again, the WISE-580x will be restored to factory default settings.

# Appendix III: Modbus TCP Slave Module Setting for WISE-580x-MTCP

WISE-580x-MTCP does not support the connection with I-7000 modules and Modbus RTU Slave modules as WISE-580x provide, but it supports the Modbus TCP protocol to connect with the Modbus TCP Slave I/O modules (up to 7). The comparison table of WISE-580x and WISE-580x-MTCP in I/O module connection is as below.

| I/O Module Support | WISE-580x | WISE-580x-MTCP |
|---|---|---|
| **Local I/O Interface for XW-Board** | Yes | Yes |
| **Remote I/O Interface by RS485** | I-7000 modules (up to 16) or Modbus RTU Slave modules (up to 10) | **No** |
| **Remote I/O Interface by Ethernet** | No | **Modbus TCP Slave modules (up to 7)** |

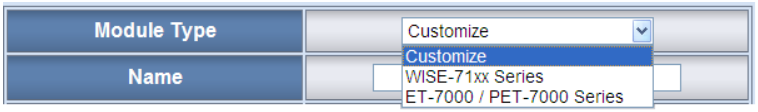
Through Modbus TCP protocol, WISE-580x-MTCP is able to read back 4 types of Modbus data (Coil Output, Discrete Input, Input Register and Holding Register) from the Modbus TCP Slave modules that are connected to the WISE-580x-MTCP, and write data on Coil Output or Holding Register from the WISE-580x-MTCP to these Modbus TCP Slave modules. WISE-580x-MTCP can use the Modbus data along with the built-in IF-THEN-ELSE logic engine to execute actions under specific conditions. The SCADA system also can retrieve the Modbus data from the WISE-580x-MTCP. The Modbus TCP Slave modules setting page is shown as follow:




Follow the following steps to complete setting:

i. Go to "Basic Setting" → "Modbus TCP Module Setting Page" to open the Modbus TCP Module Setting Page of WISE-580x-MTCP.

ii. In the "Module Type" field, there are three options for selection to define the module type of the Modbus TCP module which connect to WISE-580x-MTCP.




If the module which connect to WISE-580x-MTCP is WISE-71xx series or ET-7000/PET-7000 series, you can select "WISE-71xx Series" or "ET-7000/ PET-7000 Series" in the field first, then select the exact model name from the following dropdown list. After complete the setting, system will automatically produce the Modbus Address Table for the module you select based on its I/O channel configuration. If the module which is not in the automatic support list of WISE-580x-MTCP, please select "Customize" in the "Module Type" field, then define the Modbus Address Table for the I/O channel configuration of the module later.

iii. In the "Name" field, input the Modbus TCP Slave module name.

iv. In the "IP Address" field, input the IP of the Modbus TCP Slave module.

v. In the "Port" field, input the Modbus TCP Slave port of the Modbus TCP

module.

vi. In the “NetID” field, input the NetID of the Modbus TCP Slave module.

vii. In the “Scan Rate” field, input the time interval in seconds. The WISE-580x-MTCP will update the Modbus data from the Modbus TCP Slave module every specified time-interval. The default value is 5 seconds.

viii. In the “Polling Timeout” field, input the time interval in millisecond seconds. It is the time interval for WISE-580x-MTCP to send Modbus TCP command to the Modbus TCP Slave module and wait for the response. The default value is 500 milliseconds.

ix. In the “Connection Timeout” field, input the time interval in seconds. It is the time interval for WISE-580x-MTCP to connect to the Modbus TCP Slave module and wait for the response. The default value is 3 seconds.

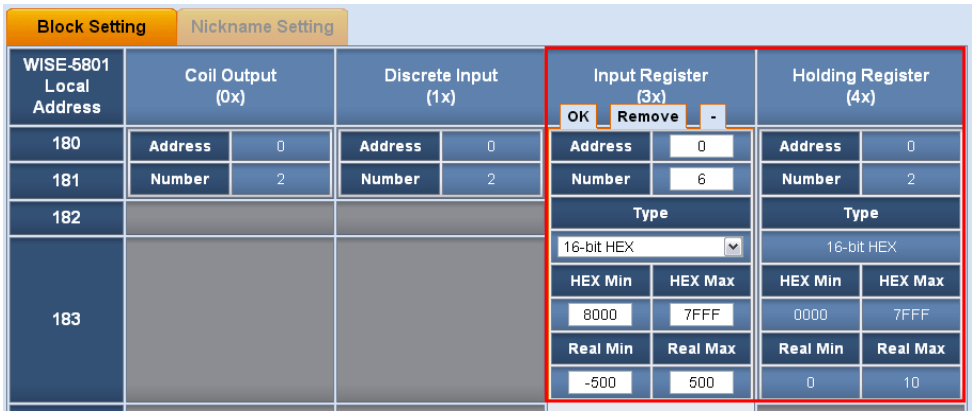
x. In the “Disconnection Retry Interval” field, input the time interval in seconds. It is the time interval to re-connect with the Modbus TCP Slave module when it is unconnected. The default value is 5 seconds.

xi. After all settings are completed, click “Add” to add the Modbus TCP Slave module to the module list. According to the Index being assigned, the I/O channel data of the Modbus TCP module will be saved in the corresponding WISE-580x-MTCP Modbus address table, for more detailed information, please refer to the following table.

xii. Select the Modbus TCP Slave module on the module list and click “Setting” button to get in to the Coil Output, Discrete Input, Input Register and Holding Register setting page to edit settings. For the detail, please refer to the section 4.7.1 ~ 4.7.4 of the WISE-580x User Manual. To remove the Modbus TCP Slave module, select the module you would like to remove and click “Remove” button. To relocate Modbus TCP Slave to other index, click “Move Up” or “Move Down” to move the Modbus TCP Slave module to the desired index.

Please note:

- If the setting of “Module Type” is “WISE-71xx Series”, then system will automatically produce the Modbus Address Table for the I/O channel configuration of the module you select in the “model name” dropdown list. You do not need to build the Modbus Address Table by yourselves.
- If the setting of “Module Type” is “ET-7000/PET-7000 Series”, then system will automatically produce the Modbus Address Table for the I/O channel configuration of the module you select in the “model name” dropdown list. Please remember to go to the “Modbus TCP Module Attribute Setting Page” of the module to check and modify the setting of HEX max/min values and Real max/min values to be the same as the setting of the physical module.




About the configuration and setting document of ET-7000/PET-7000 series modules, please visit http://ftp.icpdas.com/pub/cd/6000cd/napdos/et7000/document/ to download the ”pet_et_7000_register_table_v1.0.x.pdf” document for reference.

xiii. After all Modbus TCP Slave module settings are completed, click “Save” button to save the changes

**WISE-580x-MTCP Modbus Register Address Table:**

<table>
<tr><th>Modbus Address</th><th>00000<br>(Coils Output)</th><th>10000<br>(Discrete Input)</th><th>30000<br>(Input Registers)</th><th>40000<br>(Holding Registers)</th></tr>
<tr><td>0~19</td><td colspan="4">System Data</td></tr>
<tr><td>20~39</td><td colspan="4">XW Board Data</td></tr>
<tr><td>40~59</td><td></td><td>TCP module connection status</td><td>TCP module information</td><td rowspan="3">Internal Register Data</td></tr>
<tr><td>60-79</td><td></td><td></td><td>TCP module Error Code</td></tr>
<tr><td>80~139</td><td></td><td></td><td></td></tr>
<tr><td>180~279</td><td colspan="4">Modbus TCP Module Data (Index=1)</td></tr>
<tr><td>280~379</td><td colspan="4">Modbus TCP Module Data (Index=2)</td></tr>
<tr><td>380~479</td><td colspan="4">Modbus TCP Module Data (Index=3)</td></tr>
<tr><td>480~579</td><td colspan="4">Modbus TCP Module Data (Index=4)</td></tr>
<tr><td>580~679</td><td colspan="4">Modbus TCP Module Data (Index=5)</td></tr>
<tr><td>680~779</td><td colspan="4">Modbus TCP Module Data (Index=6)</td></tr>
<tr><td>780~879</td><td colspan="4">Modbus TCP Module Data (Index=7)</td></tr>
<tr><td>1230~1529</td><td colspan="4">The memory block for the I/O Table Data. The “I/O Data Table Configuration” setting of the “Active I/O Sending” function will be stored in this block. The maximum address length is 300. There are two data arrangement options: “Coil and Register” and “Register (Merge Coil into Register)”.</td></tr>
</table>

## Appendix IV：WISE-580x LED Indicators

LED indicators of WISE-580x provide a very convenient way of status indications for faster, easier diagnostics.

| LED | LED Status | Module Status |
|---|---|---|
| L1 | Slow Blinking Red (one second on and one second off) | The firmware is functioning normally. |
| | Blinking Red (one flash per second) | Firmware is not functioning. |
| | Solid Red | No rule file exist in the firmware or abnormal operation |
| | Others (OFF) | Abnormal operation of the firmware |
| Link(Y) / Speed(G) | Blinking | Normal operation, performing data transmission |
| | OFF | Network disconnection |
| GSM(Y) | Blinking (one flash per second) | GSM network connection failed or no SIM card. |
| | Slow Blinking (one flash per 3 seconds) | GSM network connection is normal. |
| L2 | N/A | For system reset only, please refer to Appendix II. |